

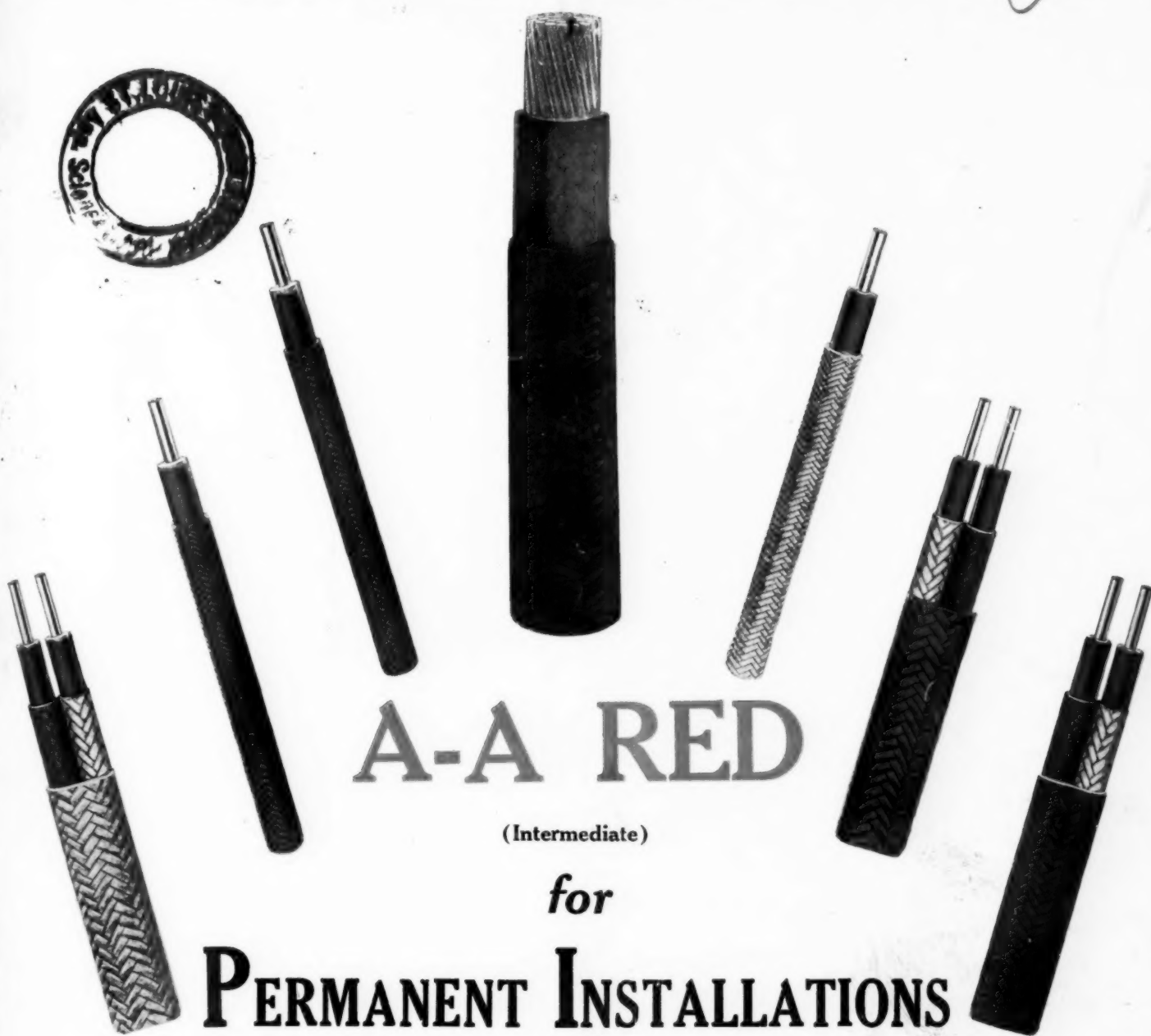
The Electragist

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INTERNATIONAL

FEBRUARY, 1925



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The Principles of The All-Metal Code

What is All-Metal?

All metal refers to a standard of wiring installation having the conductors enclosed in metal throughout and being continuously grounded throughout the entire system.

What is the All-Metal Code?

Any code which requires that all wiring—factory, office building, shop, residence, etc.—for light and power be done in conformity with the All-Metal standards of wiring is an all metal code.

What is the Need for an All-Metal Code?

The Electrical Committee of the National Fire Protection Association as a matter of public protection has required that electric wiring be grounded. A grounded system is the only safe wiring system—safe as to life and fire hazards. The All-Metal system is the only system that can be properly grounded.

The All-Metal system is permanent and not subject to injury by the work of other craftsmen in the building. Wires enclosed in metal retain their

People want to know just what this All-Metal Code is, and why it is and where it is and all about it.

Here is the information all ready to pass on to another.

The more people know about it, talk about it, hear about it, the faster will the idea take root and spread.

—The Editor.

flexibility of insulation. It is not possible with All-Metal to use conductors as a clothes line and so stretch them and disarrange them.

The All-Metal System is freer from tampering than any other system. It is much more difficult for any but authorized persons to extend interior circuits or add outlets. All-Metal requires tools that the average man about the house or school boy electrician does not have. Promiscuous tapping of electrical circuits by unauthorized persons is recognized as a real fire hazard. Circuits are overloaded and then overfused and the result is overheating.

Are There Any All-Metal Codes?

Yes! See map at the head of this story for locations. Some are recent but Wilkes-Barre and Denver, for instance, have been in continuous operation for between ten and twenty years.

Are All-Metal Codes Satisfactory?

Read the letters on the following pages from prominent contractors in All-Metal cities.

There is not an All-Metal city today that would return to lower standards. The public has been convinced through a record of lower fire losses, the contractors through a system that is easier to install and to enlarge by competent people, the inspector by fewer violations by incompetents—all have been convinced that All-Metal is essentially the only safe and proper system for all classes of buildings.

Are There Any Places Where All-Metal is Partially Required?

Virtually every important city requires All-Metal in the down town fire-proof zones.

Is it Necessary to Extend it From These Zones to Residential Districts.

If All-Metal presents the smallest fire hazard is it reasonable to require it only in fire proof buildings and not in frame buildings where there is the greatest fire hazard?

Is there not always the greatest danger of the school boy electrician and Mr. Fix-it in dwellings than in the big down-town buildings?

Yes, the All-Metal idea is necessary for all wiring—particularly residential.

Why Should the Contractor Bother Himself with Protecting the Public Against What Happens After Original Installation.

It is true that other forms of wiring are safe on installation, otherwise the National Electrical Code would not permit their use. Morphine, strychnine, etc., are safe when properly used but the state does not permit everyone to use them and insists on safeguards being placed around their use. The contractor is the professional man of the electrical industry and as such should do every-

thing in his power to protect the public.

Is the All-Metal Idea Growing?

It is! The idea is being agitated in many places and will ultimately be the only recognized standard.

Is All-Metal of Any Advantage to the Contractor?

Aside from the fact that it insures a safer job, it requires a higher grade of workman and results therefore in fewer mistakes that are costly to correct.

All-Metal will reduce the contractor's stocks of wiring supplies.

It is easier to extend or enlarge a conduit system. Extra wires can be drawn in or larger wires substituted without causing the owner a lot of trouble and expense.

All-Metal requires intelligence that the irresponsible and fly-by-night do not possess and therefore they are removed from the industry.

All-Metal makes for that better job that the public likes and will recommend—the kind that produces more satisfied customers.

Switches on Panelboards

Technical Director, The Electragist:

Have read your interesting lesson on "Estimating for Electrical Contractors" which appeared in the January issue of THE ELECTRAGIST. You have covered the ground exceedingly well and brought out many good points. Will look forward with keen anticipation to future articles on this subject.

There is one sentence, however, in paragraph—"Panelboards and Cabinets"—that the writer must take exception to. "Switches in the branch circuits of panel boards are entirely useless unless the lights are to be controlled at the panel boards." Most of the engineers and architects in this section of the country specify switches on all circuits for lighting panels in all sorts of buildings with the exception of speculative apartment houses, irrespective of whether the circuits have local control or not. We assume their object is to make it simpler, easier and safer to re-fuse the individual circuits or to add any additional work of any kind on same. They probably have in mind that it is easier to open a switch than it is to take out fuses if the particular circuit or any part of it has any fixtures to be replaced, extensions made or broken lamps removed. The cost between panels with and without

switches in the circuits is insignificant in comparison with the construction cost of a new building and we further assume that they feel that if a building is good enough to require panel boards at all it might just as well have panels with switches in the circuits rather than fuse gaps only.

We are writing you at length on this subject, as we get a different perspective here as we can tell from the quantity of orders that we receive on both types of panels just what the general trend is on this particular point.

C. E. Schoninger, Secy.
Brooklyn, N. Y.

Wishes Contractor Could Study Estimating Course

Technical Director, The Electragist:

Referring to Lesson One in Electrical Estimating, for service and main sizes, 110-220 Volt three wire, I give the following sizes as we would figure them. The service 3 wire 120-240 Volt which is the usual service is in Michigan.

Service 350,000 CM	284	Amp.
Stage No. 6	44	"
Basement No. 6	38	"
First floor 4.0	403	"
Second floor 4.0	403	"
Third floor 4.0	403	"

First, second and third floor panel locations above one another.

This layout is liberal enough to allow for some additional circuits which is usually needed in commercial buildings. However, should the contractor wish to skin the sizes he could very easily do so without detection by the architect who never looks for the sizes or would know them if he did see them and the owner discovers too late to save himself the loss it will cost him when he wishes to add a few more lights.

In closing I wish to express my respects for this work you are doing and wish that every person interested in the electrical contracting could study them.

P. F. Schagane, Flint, Mich.

[Your solution of the problem given in the January ELECTRAGIST in feeder designs is entirely correct for the voltage which you have assumed. On a basis of 110-220 volts the service wire would have to be 400,000 circular mills, otherwise the sizes would be as you have stated them.

As you say, it is very true that it is an easy matter for an unscrupulous contractor to get by with a size smaller wire than is called for by the specifications or by the Code. This fact can be used as a talking point by a contractor who has a reputation for honesty and fair dealing and if the owner has been warned on this point he might see that it is wise to have the wire sizes checked up before he accepts the job.—Technical Director.]

Small Job Overhead Out of Proportion

Some of the most successful contractors have concluded that the percentage of overhead on small jobs is larger than on large jobs.

The following table is one of the "secrets of success" of a Louisville electragist and is printed with his kind permission:

Cost price of Time and Material		Add for Overhead	Add for Profit	Total Additions for Overhd & Prof.	This allows him on the selling price For Overhd For Profit	
Under	20.00	50%	20%	80%	28%	16 2-3%
20.00 to	49.00	45%	20%	74%	26%	16 2-3%
50.00 to	249.00	40%	20%	68%	24%	16 2-3%
250.00 to	499.00	35%	20%	62%	22%	16 2-3%
500.00 to	999.00	35%	15%	55%	22%	13 %
1000.00 to	2499.00	30%	15%	50%	20%	13 %
2500.00 and over		25%	15%	44%	17½%	13 %

Electragists Tell Why They Favor All-Metal Construction

Thinking contractors from coast to coast and from gulf to border
insist there must be no lowering of present standards of wiring

AT the Washington convention of the Association of Electragists held in the fall of 1923 a resolution was adopted which was reaffirmed last year, committing the Association to do all in its power to bring about the further use of all metal protected wiring systems. There are now some twenty or more places where All-Metal is the only form of wiring permitted.

This month the Electrical Committee of the N. F. P. A. meet for the bi-annual revision of the National Electrical

Code and as certain important changes are pending the editors of THE ELECTRAGIST felt that the Electrical Committee and the industry should have the benefit of the experience of those who favor and who are working under the recognized highest form of electrical installation requirements—All-Metal.

These opinions will be found in the following letters, the originals of which were received by THE ELECTRAGIST within the past two weeks.

LOWER FIRE LOSS

Louisville has been working on the all metal basis for the last three years. After a thorough trial by different contractors we found that metal construction could be installed at practically the same cost as knob and tube. Where the material ran higher, the labor was less. The result is that it is getting better all the while because all the journeymen are now familiar with metal construction and are more speedy.

In addition to this, Mayor Quin of this city just a few nights ago, gave a talk before one of the dinner clubs of this city in which he gave figures and showed that the fire losses of this city in 1924 were practically one-half of what they were in 1923. While we are not assuming that the all-metal construction requirements of the Electrical Department are responsible for all of this saving, we take our share for a very large portion of it. These figures are available for anyone that wishes to write us for a copy of the report.

C. C. Childers,
Louisville, Ky.

HIGHER STANDARDS

Widespread approval of the movement for an All-Metal Code is indicative of an awakening consciousness for higher standards as safeguards for life and property.

The demand for an all metal code does not arise from the selfish desire to increase costs because it has been demonstrated that flexible armored conductors can be installed almost as cheaply in new buildings as the so-called knob and tube construction and at costs as low or lower when installed in existing buildings.

As an advocate of safe and sane standards in electrical construction I commend the Electragist for its leadership in the campaign for an All-Metal Code.

J. A. Fowler,
Memphis, Tenn.

SAFETY VALVE

I favor all metal electrical installations for the same reason I favor safety valves for steam boilers.

J. W. Collins, Secretary,
Chicago Electrical Contractors Association.

SPLIT STANDARDS LIKE SPLIT MORALS

May we hope for your influence in combating efforts being made by certain interests to lower standards of electrical construction. Coordinated efforts of Association of Electragists, International, inspection departments, underwriters and engineering societies have brought these standards to a high point after many years of effort. The city of Wilkes Barre has had in effect an all metal code for more than ten years with highest resulting benefits to the public, to local electrical men and to the city authorities. Unquestionably experience and careful consideration of all factors suggest there should be no going backward and that the all metal code should be insisted upon by all city governments.

The writer was more especially interested in this matter of lower wiring standards some ten or twelve years ago, because that was brought on the floor of one of our conventions in what on the face of it was offered as a popular lecture on inexpensive wiring methods in vogue in Europe, but which was in reality at once recognized as a bit of propaganda for cheaper wiring and the lower standards which almost inevitably go with it.

The suspicions aroused at that time appear to have been amply justified by later developments. What is surprising and even astonishing to us is, not that attempts should be made to produce materials for cheaper wiring systems but that it should be apparently so difficult for the National Association with the formidable backing of the underwriting interests to throw such a sprag in the very announcement of such a thing as would immediately kill it. Instead there seems to be an attitude from the very start of helplessness. Simply because a reputable manufacturer brings out a new and cheap article for wiring does not mean it should immediately be accepted as an apparently necessary thing and treated with the utmost seriousness.

With the backing which accepted standards of electrical construction were receiving and had acquired at the time this new material was brought out and whatever the means for combating it might have been, there is something wrong in a system or a method when a thing of this kind can go as far as has this one.

The very fact that this material can be readily installed by practically any one with-

out electrical knowledge or experience, we submit, is enough on the face of it to condemn it beyond any question of a hearing or any consideration of inherently good qualities with respect to mechanical construction, high insulating qualities, etc. All of these are or should be extraneous matter and dust in the eyes of the main proposition, which is, does or does not the use of this material however good in itself, tend to lower or does it tend to elevate the standards of electrical construction?

If the former it should be unhesitatingly and summarily condemned; if the latter there is nothing that will stop or prevent its adoption. Furthermore, it should be adopted.

Let the point be made clear, however, that there must be no going back in this matter of standards and that any new material which falls below present accepted standards must not be given consideration, regardless of price, convenience, utility, or kindred reasons.

If the above seems strongly put it is because the subject demands plain speaking. We feel just as strongly on this question of split standards as we would feel on split morals. There can be no compromise with either if the ends sought are high standards. This in the end means safety and satisfaction whether one have reference to electrical construction or to morals.

We would like to see this entire matter when it comes up in February handled on the basis above suggested and that a statement so clear and so definite be made as to the status of any new materials submitted as to leave in the mind of anyone no doubt as to the attitude of the Electrical Committee of the N. F. P. A. on any such matters as may from time to time be brought up.

G. E. Shepherd,
Wilkes-Barre, Pa.

REDUCES HAZARDS

You no doubt are aware of the fact that Wilkes-Barre was one of the first cities to adopt the All-Metal wiring code. Through the combined efforts of the electrical contractors here laws were passed to bring this about and it has been of great benefit to the electrical industry and also to the users of electricity. It has too many advantageous features to be fully mentioned here. How-

ever, I will endeavor to explain just a few of the cardinal points in its favor, viz:

First. It greatly reduces life hazard.
Second. It reduces fire hazard.
Third. It can be installed in a mechanical and workmanlike manner.

Fourth. It raises the standard of the industry.

Fifth. It reduces the trouble from short circuits and grounds.

Sixth. It has a tendency to reduce the installation of small additions to electrical systems by incompetent workmen.

Seventh. It is advantageous to the light company from the standpoint that it will reduce the stealing of current.

Eighth. It raises the skill of the electrical mechanic.

Ninth. It simplifies the installation of additional work, as one circuit in a pipe can be readily removed and two circuits can be installed, should that be necessary. This reduces to a minimum the danger of overload on lines.

Tenth. It is not cheap—and we American people do not like cheap things.

I am personally of the belief that the electrical industry should be raised to a higher standard rather than to be lowered by cheap and inferior grades of electrical material. We can again apply that same old adage—"One cannot get something for nothing."

Frank E. Baldwin,
Wilkes-Barre, Pa.

NO TAMPERING

Our code for wiring in this city calls for an all-metal wiring job, which gives 100 per cent. safety to all residences, stores, mills and manufacturing places that are wired according to the Code.

It is work where an amateur cannot tamper with the wires. I find in homes that are wired according to the old method of wiring that nearly every job has had some amateur wiring put in since the electrician was there and that it is put in with lamp cord tapped between the floors or mutilated in some other way. This would have been impossible had the wiring been all metal.

The neighboring towns are now using about 90 per cent. all-metal wiring because they find it to make a far better job.

I find in estimating a house, new or old, that I can give an all-metal wiring job for only 10 per cent. more than what it would have cost for the old method of wiring, and at these times when we are paying \$9 to \$10 a day for electricians I certainly do not want to pay this price for drilling holes all day. The labor is cut in half by using the all-metal wiring job and it stays finished after being installed correctly. With the old method of wiring the customer paid about 70 per cent. labor and the new method is about 30 per cent. labor, and a far better job.

I would like to see this code for All-Metal wiring adopted in all towns, cities and states of the Union, as I am sure the fire hazard would be less, and besides a grounded job is always better because the moment there is a little trouble in the wiring system it can be detected before much damage is done.

Jos. H. Schmidt,
Wilkes-Barre, Pa.

NO REASON FOR DIFFERENT STANDARDS

Some of my reasons for favoring an all-metal standard are as follows:

1. A metal protection for electric wires has long been recognized by the underwriters and other authorities as being the best and safest type of installation.

2. It is in the interest of standardization. There is no good reason for installing open wires in one type of building and metal enclosed wires in another, as is now done.

3. It makes it more difficult for the inexperienced to tamper with a system, tapping wires wherever they choose to.

4. It simplifies stocks and enables us to train men in one class of installation, thus increasing their efficiency.

C. L. Chamblin,
San Francisco, Cal.

EASIER TO MAKE CHANGES

Regarding the all-metal standard—I am heartily in favor of same. I feel that it is the only way to install a job, as changes can be made at any time with a very small cost to owner or tenant.

In my class of work I am constantly making changes to systems already installed and can say that it is a great benefit to find most of the jobs conduit construction.

Victor Lemoge,
San Francisco, Cal.

SAFE, PERMANENT, ECONOMIC

In advocating the desirability of an all-metal Code three main factors are to be considered: Safety, permanency and economy.

Based on the assumption that in all classes of wiring the best quality of material and workmanship is used there is no question of the superiority as far as safety and permanency are concerned of:

First—A complete conduit system.

Second—A metal moulding system.

Third—An armored cable system.

Each has its distinctive field—the conduit system for fireproof structures, either concealed or exposed; the metal moulding for changes and additions installed on the surface from existing concealed conduit system or an entire system on the surface; the armored cable system for old non-fireproof structures such as residences, stores and apartment houses where a conduit system would entail too much cutting and expense, also in new non-fireproof structures of the cheaper class where low cost must necessarily be considered.

Against the all-metal systems we have the non-metallic, comprising so-called knob and tube work, non-metallic conduit for concealed work and cleat work for surface installations. These systems when properly installed may be considered reasonably safe originally from the fire hazard standpoint; nevertheless they give the impression of a temporary makeshift installation and are subject to injury after installation, particularly cleat work on the surface. It is no exaggeration to state that these cleated surface conductors are used for hanging up all other sorts of articles and no attention is paid to their protection by other mechanics making changes or repairs in the building. This latter also holds true with the non-metallic concealed systems.

In the factor of economy, comparison can only be drawn between the cost of cleat work and conduit or metal moulding for surface work. There is, of course, a considerable difference of cost between these methods, but surface cleat work is practically obsolete except possibly in mill construction and so is practically negligible.

There then remains from the cost standpoint the concealed systems in non-fireproof structures, namely armored cable, non-metallic loom conduit and knob and tube. Comparing the cost of material as between armored cable and non-metallic loom conduit there is a difference of approximately 20 per cent. in favor of armored cable to which should be added

the saving cost of labor. With armored cable it is only necessary to bore one hole through floor beams, etc., and run one member. With loom conduit two holes are necessary and two members to run in addition to fishing and pulling in the conductors. As from the foregoing loom conduit is the most costly there is no necessity of comparing this with knob and tube systems.

Comparing cost of material between armored cable and knob and tube systems there is, in the writer's opinion, an average of 40 per cent. in favor of knob and tube work. Again, however, the cost of labor enters in the same manner as between armored cable and loom conduit.

The knob and tube method requires the boring of two holes, the bushing of these holes with porcelain tubes, etc., and while the writer has had no experience in knob and tube work for 35 years or more he is of the opinion, particularly with the present high cost of labor, that an armored cable system can be installed as cheaply and possibly cheaper than knob and tube work.

The writer is a strong adherent of "All-Metal Systems" and can see no good reason why an "All-Metal" Code should not become universal in the near future.

J. C. Hatzel,
New York, N. Y.

SAFETY FROM TAMPERING

We hereby wish to go on record as being opposed to the continuance of the so-called knob and tube system of wiring for residences, apartment houses and all other types of buildings.

In my opinion it is not as safe as the all-metal system of wiring. It is much easier for the inexperienced and unauthorized person to tamper with the system and also for the reason that with a little experience the all-metal system can be installed just as cheap as the knob and tube system.

Geo. D. F. Smith,
San Francisco, Cal.

LESS TROUBLE FROM AMATEURS

We heartily endorse all-metal installations for the two following reasons:

(1) They reduce the dangerous practice of amateurs and unscrupulous contractors making taps of all kinds and descriptions along circuits where wires are not encased in metal.

(2) They stop fire from crawling along the insulation of wires not metal encased, thereby preventing the spreading of fire over greater areas.

R. Ouer,
San Francisco, Cal.

ELIMINATES TROUBLE FROM OTHER CRAFTS

The following are some of the reasons of interest to the contractor for all-metal systems:

Eliminates errors so common in making taps.

Makes possible the replacing of defective wires without trouble.

Eliminates the trouble caused by other crafts on job in cutting or injuring wires.

Re-arrangement of switching made easier. Allowance for additional circuit made easier.

Makes possible grounding of fixtures on grounded neutral systems.

Furnishes substantial fixture support.

B. E. Arntsen,
Minneapolis, Minn.

CAN BE GROUNDED

We have been on an all-metal code in this city since last spring. Formerly we were on all-metal or conduit in the downtown district and certain classes of buildings.

There is no doubt that conduit wiring is the best method of wiring from a point of accessibility, safety from fire, storms and excess in voltage. Conduit must be put up by some one who is familiar with pipe work and therefore is a safer job and less dangerous to the public, while with other kinds of wiring inexperienced people use lamp and telephone wire or anything they can get a hold of to wire the buildings. We have seen whole houses wired from one outlet on one piece of lamp cord run through partitions and floors with no protection to them.

The plumbers require licensed men to install their pipes and their fixtures for safety to the owner of the residence. Why then should not the wiring be done in the best possible way when a poorly wired job is a menace not only to the owner or occupant of the building, but to the neighbors as well; in fact, more so than plumbing?

A conduit job cannot readily be tapped by school boys and inexperienced persons and if people won't protect themselves the city authorities must do it for them by making requirements for safety in wiring.

Since the advent of neutral grounding the danger from fire in any kind of wiring but conduit has increased, but the necessity of protecting human life from excessive voltage has made this the accepted and best-practice, so conduit wiring is now considered the best and safest method of wiring and the day is not far away when no other method will be allowed.

Louis B. VanNuys,
Peoria, Ill.

BETTER WORKMANSHIP

Many of our live electrical contractors favor all-metal conduit wiring from a safety first standpoint. All-metal conduit jobs mean better workmanship and safer construction with fewer hazards both to life and property.

Israel Lovett, City Electrician,
Omaha, Neb.

FREE FROM FIRES

The city of Oneonta, N. Y., has required all electric light and power wiring to be installed in metal conduits for several years and has encountered little or no trouble in enforcing the rule and no opposition since the method had a short trial.

The city is remarkably free from fires, although previous to this ruling it had a bad name for frequent conflagrations. This condition was the cause of a general effort towards fire prevention and it is believed that the "all-metal" rule was one of the most beneficial reforms.

In my opinion exposed insulated wires soon become familiar to the eye and since no harm apparently comes from them people soon fail to have the proper regard for them and are apt to attach loose articles to them, often causing the wires to stretch and suffer mechanical harm and in various ways to short circuit the current.

I have frequently removed open wiring on which the rubber had become brittle enough to crack from exposure to air, heat or moisture. In metal the insulation is not so readily attacked by the elements and the chances of mechanical injury from driven nails and breaking of timbers and the like are more remote.

However, of more importance even than

these is the fact that the amateurs and those ignorant of the trade are less apt to meddle with metal enclosed wires, having neither the skill nor tools necessary to work with metal conduits.

There is also a more wholesome respect for dangerous wires properly protected and concealed.

Lastly, the cost of metal enclosed wiring is but little more and in some cases less than knob and tube, cleat or wood moulding work, but with the advantage of leaving timbers stronger and taking up less room. Certainly the workman and owner have more pride in a metal installation.

C. E. Miller,
Oneonta, N. Y.

BEST FOR PUBLIC

At each of the last four meetings of the Florida Association of Electragists, covering the four different sections of the state, the question of an all-metal code was taken up and discussed thoroughly.

It was the practically unanimous opinion that the all-metal code would work out to the best advantage of the customer and everyone connected with the electrical industry.

It was pointed out that not only would an all-metal code require a better class of workmen to handle the work under those conditions, but that there would be less unauthorized work done than there is on the present knob and tube class of wiring.

In addition the all-metal code would give a wiring job that would relieve the customer from all personal danger from electrical troubles; it would eliminate the fire hazard from electric wiring, thereby having a tendency towards reducing insurance rates; it would relieve the contractor from having duplicate stocks on hand which would enable him to run his business at greater efficiency and lower operating costs which in turn could be passed on to his customer who, in the end, would receive a better job, one with a lower rate of depreciation, less cost of maintenance and at no increase in cost of installation.

The Florida Association of Electragists will appreciate any help the Association of Electragists can give us to see that an all-metal code is adopted at the very earliest possible time.

Chas. E. James, Secretary,
Florida Association of Electragists.

RAISE STANDARDS OF ELECTRICAL WORK

My personal reasons for favoring an all metal code are that it will not only raise the standards of electrical work but will assure the property owners of a better class of work and a safer protection from fire and other hazards which he has to contend with in other class of work by people coming to this State who have no responsibility and who only stay for a short period and who work in districts where daily permits and inspections are not enforced.

Preston Ayers, Pres.,
Florida Association of Electragists.

LESS FIRE HAZARD

In conduit installations the wires are better protected from mechanical injury, extensions are not easily made by unauthorized persons, repairs are facilitated, regrouping and extension of circuits is possible without tearing out partitions and floors. The danger of accidental contact with live parts is less; therefore the occupant of the building

is better protected from accidental injury. The fire hazard is less, as the wires are not exposed to mechanical disarrangement and in event of crossing, shorting or grounding the properly grounded conduit is of sufficient capacity to carry the resulting current without undue heating. The central station is better protected from theft of current.

E. W. Lawson,
Palm Beach, Fla.

LOWER FIRE HAZARD

We favor an all metal law requiring uniform construction standards the State over, which would tend to lessen fire hazard and reduce present rates of insurance constituting a less expensive job in the end for the general public due to the long life and low cost of maintenance.

T. A. Brown,
St. Petersburg, Fla.

ELIMINATE UNAUTHORIZED TAPPING

We think Florida should be an all metal State because dealers will not have to carry so many different kinds of fittings. All-Metal will give better service to customers; will eliminate tapping of wires between outlets by unauthorized persons; will make fire hazard less, and will make State fire proof so far as electrical work is concerned.

L. E. Means, Jr.,
Gainesville, Fla.

NEW EFFICIENT STANDARDS

We favor all metal wiring as a step toward greater efficiency in electrical wiring standardization, materials and general safety of property.

Holt Electrical Co.,
Jacksonville, Fla.

ELIMINATE INEFFICIENT WIREMEN

Our association favors all metal wiring because it means safer and neater jobs; the carrying by the contractor of a less varied stock of material; and the elimination of inefficient electrical workers.

W. H. Secrest, Secy.,
Jacksonville, Fla., Association of Electragists.

ORLANDO APPROVES

All metal code approved by Local Association unanimously, signed: Ayers Electric Co., Johnson Electric Co., A. P. Curry Electric Co., Newell Electric Co., Hughes Electric Co., Treadwell Electric Shop, Jones Electric Shop.

Preston Ayers,
Orlando, Fla.

TRADE UPLIFT

General opinion here is that an all metal code will bring an increased volume of business and general uplift of trade.

Geo. Van Deusen, Secy.,
Daytona Beach, Fla., Asso. of Electragists.

DRUGGISTS HAVE AS MUCH RIGHT TO SELL DRUGS AT RANDOM

There is no substantial argument against the safety nor the ultimate economy of all metal wiring. I base this statement on the fact of seventeen years experience with all metal ordinance requirements here in Denver. This city adopted the rule back in 1908, and we would no more think of abandoning it than we would consider going back to candles for illumination. We don't even limit it to the usual fire zones, but take in the entire city limits. Furthermore, the town of Englewood, a large suburb which will no doubt later be added to our city limits, has just

authorized its town board to adopt an all metal wiring ordinance. Other cities in Colorado are following our lead, and this includes some that operate municipal lighting plants, such as Ft. Morgan.

The reasons in favor of all metal work are so well known that it seems almost unnecessary to repeat them: safety, mechanical superiority, durability; all of them more or less inter-related. Isn't the reduction of life and fire hazard almost to the point of elimination reason enough?

We electragists are our brother's keeper when it comes to electrical installations. The layman doesn't understand the hazards of inferior work, except possibly in a dim way. When he comes to us and asks us to install wiring to produce certain results which he has in mind, whether it be lighting, or power or an advertising sign, what he wants is not merely to get the current to the desired point, but he wants to get it there in such a way that *there is no risk*.

But, some one says, open work gets it there safely. Let's grant that it does when the electragist has finished and turns over the job. *What guarantee has the owner that it will stay that way?* It seems to me that we have no more right to install wiring that may easily be tampered with by a novice than the chemist has a right to sell dangerous drugs at random, or the food packer has a

right to put quantities of preservatives into rotting food.

We haven't even the right to permit a property owner to say to us that he realizes this hazard and will assume it for the sake of a few dollars lower installation cost in his wiring. I say the community, in such cases is justified in telling that man "you may be willing to risk yourself, but you can't subject your neighbors and your employees to the added risk." We don't permit the use of unsafe building materials in our cities; and when we pass upon the material to determine whether or not it is safe we take into consideration not only its present condition but the probabilities of the material becoming unsafe under the conditions where they are used.

As to durability of the material, or the installation, more than any branch of the building industry are we concerned with the need for making our installations proof against tampering. Now, when we install open work or concealed knob and tube work or whatever you wish to call it, we leave something that any novice can touch easily. On the other hand, in all metal work first of all tools are required. The novice rarely has the necessary tools. Next, a mechanic's knowledge is required and so, even if an amateur is tackling the job he very probably is so well versed in mechanical matters that he

isn't likely to do a bad job. In ninety-nine cases out of a hundred, the novice won't tackle the job at all, but will send for a man who is competent to handle it.

In Denver the all metal rule was established by ordinance in 1908. The public has become educated to it and is satisfied with it. Even if other kind of work were permitted, it would be impossible to sell it.

E. C. Headrick,
Denver, Colo.

PROTECTS PUBLIC

One who comes in contact with the electrical wiring conditions as I do, certainly is in a mighty fine position to pass judgment on a wiring installation. My job is to protect the public from inferior installation of any kind, so that in so far as possible hazards to property and safety to life and health is carefully guarded by our department. I am strong for the all metal.

Charles F. Oehmler,
Chief City Electrician, Denver, Colo.

BETTER GROUNDING

We used to permit concealed knob and tube wiring in one and two-family dwellings outside of the "Fire Limits" but March 31, 1922, an ordinance was passed requiring conduit construction for all concealed or exposed light and power wiring in the city.

There was considerable opposition at first from the Real Estate Board and some building contractors, owing to the increased cost, but everyone concerned now seems well satisfied.

The increased cost of wiring was noticeable the first six months, but the prices came down with the greater volume of rigid and flexible steel conduit, and armored cable used as well as the added experience of the wiremen with this method of construction.

In concealed work in old buildings the material, when using armored cable, is not a bit higher than if non-metallic flexible tubing (loom) is used, with outlet boxes, flexible tubing fasteners, etc., as is now required by the National Electrical Code.

From an inspector's standpoint, I prefer conduit construction. It is easier to ascertain whether or not the armor of a cable is continuous from outlet to outlet by testing, whereas with non-metallic flexible tubing we used to be compelled to pull it out in order to make sure that it was continuous.

From the stand-point of safety, the argument is strongly in favor of conduit.

We ground our fixtures, which we consider the safest method of preventing the user from receiving an electrical shock when the live conductor has come in contact with the socket shell or other part of a fixture.

In my opinion it is dangerous practice to permit insulated fixtures in bath-rooms, kitchens, basements, etc.

Porcelain sockets eliminate only a small fraction of the hazard, as the rest of the fixture may be alive.

In order to ground them in a knob and tube installation, it requires an additional wire throughout the entire system, unless gas piping is present, which is seldom the case in present day building practice.

In a conduit installation there is less cutting of timbers around the center of distribution and the presence of a large amount of inflammable material at these points in a knob and tube installation are other good reasons for using conduit.

Oscar M. Frykman,
Chief Electrical Inspector, Minneapolis, Minn.

Dressing Up the Store



The Arseco Electric Shop, down in Memphis, Tenn., believes that a good store is one of the first requisites for a good business. Therefore, when they were arranging their store recently they tried and succeeded in getting an effect which is bound to please the eye and sooth the nerves of the customer. Separ-

ate compartments are used for all major appliances, giving the floor a clean, spacious appearance and a rather "homey" look results from placing comfortable chairs and a table on the floor in a "carefully careless" way. The photograph was furnished by the Westinghouse Electric & Mfg. Company.

Estimating for Electrical Contractors

Lesson No. 2—Taking Off Material

By ARTHUR L. ABBOTT

Technical Director, Association of Electragists, International

THE estimator's time is valuable and must be conserved; he must learn to work with speed, also with accuracy, for time is saved by being careful and accurate as well as by working rapidly. It is essential that the estimator be provided with a few simple tools and appliances; without these the work will be much slower and more laborious and frequent errors are probable. A complete equipment is illustrated here.

The Chicago Electrical Estimators Association have made some study to determine the best type of rotometer, and have finally selected a make which is about the size of a well-known inexpensive watch and has a re-setting button. This particular type costs about \$4.00. The writer has used one of these instruments with very satisfactory results.

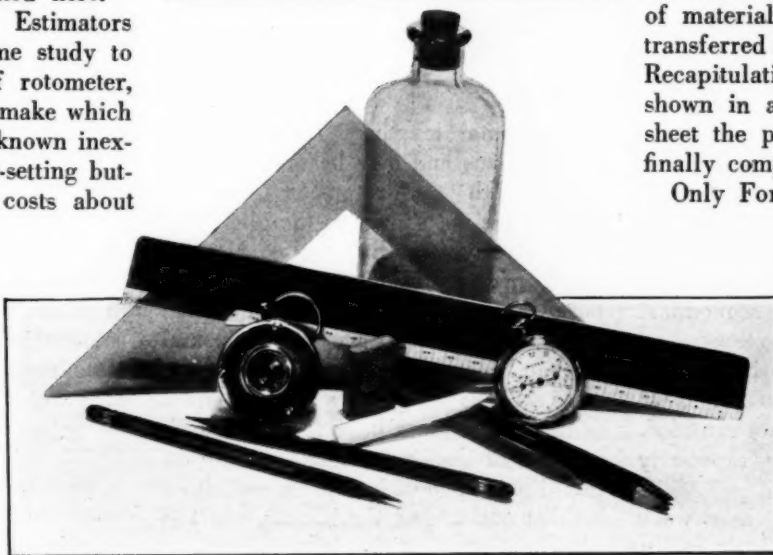
The tallying machine is held in the left hand with the thumb on a lever which is depressed once for each unit counted. The price is \$3.20 at the present time.

The best form of draftsman's scale for all-around use is the opposite-bevel type, 12 inches long, with one scale of $\frac{1}{8}$ inch and $\frac{1}{4}$ inch to the foot, and one scale of $\frac{1}{2}$ inch and 1 inch to the foot. The most convenient straight edge is a draftsman's celluloid triangle of medium size.

Another requisite to the attainment of speed and accuracy in estimating is a suitable set of printed forms. Use of the proper forms makes your work systematic. Any work can be done more rapidly and with less likelihood of errors or omissions when it is done systematically. Ten cents will buy all the forms needed to estimate a good sized job; to do without them is poor economy.

The Association of Electragists publishes a set of estimating forms which fulfill all requirements except for very

THIS is the second lesson in the Course in Electrical Estimating by America's foremost authority on this subject. This course started in the January issue with a complete description on how to lay out a job preparatory to taking off quantities and gave the necessary wire and conduit tables. The present lesson tells how to take off quantities in a systematic manner. —The Editor.



The Estimator's Kit of Tools

Common Lead Pencils
Colored Pencils
Pencil Eraser
White Chalk
A Bottle of Gasoline
Rotometer
Tallying Machine
Scale
Straight Edge

large jobs. There are five forms in the set.

Form 1 is for the original entries of branch circuit quantities scaled and counted on the plans. Suitable columns are also provided for computing quantities of wire, which are figured from the conduit quantities.

Form 2 is for the original entries of

feeder and motor circuit conduit and wire. This form is also convenient for use as a tabulation sheet for panelboards and cabinets and other special materials, as fuses, bells, clocks, etc. Form 3 is used to summarize conduit and wire quantities which have been originally entered on Form 2.

Final quantities are arrived at on the first three forms and are then entered on the Pricing Sheet, Form 4. The totals of material cost and labor hours are transferred from the Pricing Sheets to a Recapitulation Sheet, which will be shown in a later article, and on this sheet the price which is to be bid is finally computed.

Only Form 1 and Form 4 need be used for very small jobs. If there are two or three feeder runs and a small number of cabinets and panelboards to be listed, all these items can be accommodated by one sheet of Form 2; but when there are as many as six or eight feeder runs it is best to summarize them on Form 3. The Recapitulation Sheet, Form 5, need not be used when

only one Pricing Sheet is required; it will sometimes be useful if there are two Pricing Sheets, and always if there are three.

On very large and complex jobs a larger sheet with more vertical columns and more horizontal lines may be required in place of Form 1, but for the average run of work it will be found difficult to improve on this set of forms to any great extent. They embody ideas adapted from many different sources and are the result of years of study and trial. However, the essential thing is to provide yourself with a complete set of forms, which are adapted to the purpose for which they are to be used; any other sheets may be used so long as they fulfill these requirements.

ding or subtracting the necessary number. Counting gang switch boxes as an equivalent number of single boxes will throw you off a little.

After completing the taking off of all branch circuit items and entering them on the form, total all columns. You should on this form, and on the other preliminary forms, arrive at the final figures which are to be entered on the pricing sheet, so that you or anyone else can retrace your steps and see just how each figure shown on this sheet was arrived at. As a rule, some allowance for possible errors and wasted material should be added to each one of your totals. The amount of this allowance will in every case depend upon the pains you have taken to make your work accurate. Only small allowances need be made if you have been very careful and have checked your work. In this case your allowances should be on the order of 1 percent or 2 percent, though this should not be considered as a fixed rule. In any case try to bring your total up to a round number. Thus if a total of 22,629 ft. of $\frac{1}{2}$ inch conduit is arrived at, add 171 ft. to bring the total up to 22,800, which is an easier figure to work with.

Bring down your revised totals of outlets and enter them in the space provided in the lower part of the sheet and find the total number of outlets. From the revised totals of the various pipe and wire combinations, figure the quantities of wire required and enter these in the space in the lower left corner; enter the total of "odd" wire, and an allowance for the extra wire at outlets—2 ft. to 3 ft. of single wire per outlet. After the cabinets and panelboards have been listed and the total number of circuits found, enter the proper allowance for extra wire at cabinet—this will be from 6 ft. to 10 ft. per circuit or even more if some cabinets are very large. Total these quantities, add allowances, and so arrive at the final quantities of wire.

Feeders

Next in order come the feeders. On a sheet of Form 2, the Feeder Schedule, list all the feeders, assigning a number to each, and fill in for each feeder the point from which it runs, (switchboard or cabinet), point to which it runs, size of conduit, size and number of wires.

Referring to the feeder diagram, begin with Feeder No. 1, scale off the

SOLUTION OF PROBLEM IN FEEDER DESIGN GIVEN IN THE JANUARY ISSUE

Cabinet	Connected Watts	Load Amperes
Stage	10560	48.0
Basement	9100	41.4
1st Floor	12460	56.6
2nd Floor	18700	85.0
3rd Floor	17420	79.2
TOTAL		310.2

Feeder	Ampere	Size Wire	Size Conduit	Length in Ft.	Ampere Feet	Drop Percent
Service	310	400,000 C.M.	3 "	55	17050	.4
To stage	48	No. 6	$1\frac{1}{4}$ "	31	1488	.5
To Basement	41	No. 6	$1\frac{1}{4}$ "	67	2747	1.0
To 1st. Floor	221	No. 4/0	$2\frac{1}{2}$ "	83	18343	.9
1st. to 2nd Fl.	164	No. 4/0	$2\frac{1}{2}$ "	13	2132	.1
2nd to 3rd Fl.	79	No. 4/0	$2\frac{1}{2}$ "	11	869	--

The current to be carried by each feeder is first computed, and then the size of wire required to carry this current and the corresponding size of conduit are taken from the table. The wire sizes are then checked for voltage drop. The maximum drop from the service cabinet to any other cabinet is 1 percent, which is satisfactory, therefore the sizes based on carrying capacity alone are sufficiently large.

horizontal length of conduit from the floor plans, and the vertical length from the diagram, using the rotometer. Enter the length of conduit on the form, also the number of elbows, bends, and terminals. "Elbows" are the factory-made 90 deg. variety. "Bends" are those made on the job, usually much less than 90 deg. A terminal is any end of a pipe, at a cabinet, pull-box, or conduit or other similar fitting. Next fill in the length of wire, which will of course always be the length of conduit plus a certain amount, multiplied by the number of wires. Take off quantities for each feeder in this way, checking each one on the diagram as you finish it. While taking off and listing this material, make a note of special items required, such as pull-boxes, hangers, condulets, etc. These items can be listed in the right-hand column of the Feeder Schedule.

When the material has all been listed on the Feeder Schedule, it must be transferred to the Summary Sheet, Form 3, so that the quantities can be totaled. Beginning with the smallest size of pipe, head columns on the Summary Sheet for each size thus:

$\frac{3}{4}$ in. | Term. | Bends, $1\frac{1}{4}$ in. | Ls | Term. | Bends.

Also head one column for each size of wire. Then transfer each item from the Schedule to the Summary, checking

each item on the Schedule with a red pencil as it is entered on the Summary. Total all items and add allowances as you did on the Branch Circuit Schedule. Items of small wire which appear on both Form 1 and Form 3 should be transferred from Form 3 to Form 1 so as to get a grand total, again checking with a red pencil each item so transferred. A small quantity of small sizes of pipe may be transferred from the Feeder Schedule in the same way.

Cabinets and Panelboards

Cabinets and panelboards should next be listed. The Feeder Schedule Sheet is well adapted to this purpose, though of course the column headings will be disregarded.

As mentioned under the subject of "layouts," it is advisable to make up a complete specification of your own to submit to panelboard manufacturers for prices, unless the specifications furnished by the architect are very complete and specific, which is not usually the case. If the specifications are indefinite or incomplete in any way, the manufacturer will take no chances, but will always figure high enough to be safe. A lower price will nearly always be secured if you take all responsibility and specify exactly what you want.

It will probably be most convenient to make up first a list of panelboards giving the specification requirements, and then make another list for figuring labor. As will be explained later, the labor is figured per terminal of each size. The items might be listed on the Pricing Sheet so that the labor computations can be shown there, but it is preferable to make these computations on a preliminary sheet and enter on the pricing sheet only the labor hours for each panel and cabinet.

Make a tabulation as follows:

Terminals	30amp.	60amp.	100amp.	200amp.	400amp.
Hours Ea.	.27	.55	.78	1.13	1.63
Cab. No.					
Main	1	3		6	7
B	12	3			
1A	28		3		
1B	32		3		
2A	28		3		
2B	24	3	3		
3A	20	3			
3B	20	3			
Hours	(20.11)	(4.89)	(7.90)	(10.98)	(7.90)
			(10.47)	(6.05)	(6.05)

The table as made up at this stage of the proceedings will be without the figures enclosed in parentheses. These figures will be referred to later.

(Continued on page 24)

A Simple But Effective Receipt for Reducing Labor Turnover

IF the firm makes money the employees are rewarded.

This is the basis of employee relations that has existed for many years in the J. F. Buchanan Company, one of Philadelphia's leading electrical contracting organizations.

Does it pay?

Mr. Buchanan feels it does and in support of his contention he cites the following figures:

67½ percent of his employees have been with him two years and over.

42½ percent, five years and over.

20 percent, ten years and over.

Labor turnover is an important subject in contracting management. Each house has certain standards—certain peculiarities that differentiate it from other concerns. New employees have to learn these things and it sometimes is a costly period of instruction for the employer.

Employees who have been continuously in the employ of one concern for any length of time, it is generally found, are men on whom the company can depend. If the men were not dependable they would have been laid off long ago. Dependable men always have the employer's interest. They do a grade of work that brings the employer more work.

Moreover, men who have been with an employer a long time, as a rule, are a good steadying influence on the more recent employees.

Workmen are quick to perceive that other things being equal men stay with a concern because the boss is fair. When the men are dissatisfied they spend a lot of time talking—when they are satisfied they spend a lot of time working.

For the past seven years Mr. Buchanan has given his employees a Christmas party at which time each employee receives a check based upon his year's wages. Everyone from office boy and porter up shares in this Christmas present.

The employees receive this Christmas bonus only when the year has been profitable for the company. This the employees know and, according to Mr.



The Christmas Spirit is Evident on the Face of Every Buchanan Employee at This Party. The Christmas Spirit Means Good Will to All and This Includes Employers

Buchanan, it has had the very beneficial effect of making each employee feel that he has a personal interest in the welfare of the company. He finds that the men are not only less careless about material and the use of their own time, but they are equally exacting of their fellow workmen.

The morale in other words has reached a very high plane and it is not difficult to find out whom the slackers are amongst new employees.

The Christmas Party

Invitations to the Christmas party, which is held just a few days before Christmas always include the employee and his wife, mother or sweetheart. As most of the men are married and the invitations are sent to the homes the wives are tremendously interested. They are not apt to forget the Christmas banquet and dance and the check, and if the man is thinking about making a change

he is likely to meet with opposition at home.

Each year arrangements for the party are placed in the hands of a committee chosen by the employees from their own ranks. The people decide what kind of a party they want and where they want to hold it, and as it is always within reason the company says to the committee, "All right, go ahead."

This past year for instance, the party was held in the Gold Room of the Hotel Adelphi, one of Philadelphia's leading hotels, where a dinner was served and later, after the distribution of the checks, dancing was enjoyed. The photograph shows the gathering—and all the employees were there.

The invitations to the employees stated that at the dinner bonus checks would be given to all who attend and that the basis would be the same as in past years, namely:

Any employee who has been in the

company's employ continuously for

2 years and less than	4, 1 percent
4 years and less than	6, 2 percent
6 years and less than	8, 3 percent
8 years and less than	10, 4 percent
10 years and over,	5 percent

based on the amount of compensation received during the entire year.

Some men received as high as \$200. Those who have been with the company only a short time got checks of \$3 but all received something and in all approximately \$2700 was distributed this year.

It is important to point out that the bonus is based on compensation and not on a percentage of profit because in Mr. Buchanan's mind such a course is always open to criticism and fault finding. Some people would feel and say that the boss was withholding profits by paying himself too large a salary, etc., etc., and the net result instead of building employee good-will would breed distrust and suspicion.

The evening each year starts with a dinner at the close of which Mr. Buchanan tells his people in a short address what the Christmas meeting means to the company and why the company likes to share with its people some of the profits which they have helped create.

Then one by one the employees are called forward with a special friendly greeting for each and are presented with a sealed envelope inside which is the individual's check.

Employee appreciation is somewhat indefinite. It is generally found in the morale of the force. The average employee is as a rule rather shy when it comes to telling the employer that he is appreciative. It's just a human trait.

This year, however, there were a number of little incidents that showed employee appreciation.

After the employees had received their gifts it was Mr. Buchanan's turn to be surprised, for the men and women in his employ had chipped in and purchased him a beautiful gold watch, suitably engraved which they presented to him that evening, and then in turn they presented Mrs. Buchanan a full blooming Christmas Plant.

And then one of the men who had received a \$3 check and who had previously been employed twice by the company and had left, said to Mr. Buchanan, "The next time I leave this company it will be because I am fired."

Does this sort of spirit pay?

A Fair Profit

"A salesman is a man who not only sells a thing but sells it at a profit. When you thing you have broken it off in somebody else by selling something at a cut price, you are acting against the American principle of fair play and if you cut a job today, you may beat your competitor, but if he also does it

and the next time you cut still more, you destroy both your and his chances to make a proper profit and become a bad credit risk and the situation created is unsatisfactory for everyone. A fair profit is the share of every tradesman and the public is prepared to pay it." —B. L. Hamner before the Florida Association of Electragists.

Estimating for Electrical Contractors

(Continued from page 22)

A tabulation of fuses should next be made in this way:

FUSES				
Cab. No.	Plug	60 amp.	200 amp.	400 amp.
Main		2	4	2
B	12	--	--	--
1A	28	--	--	--
1B	32	--	--	--
2A	28	--	--	--
2B	24	2	--	--
3A	20	--	--	--
3B	20	--	--	--
Total	164	4	4	2

Entering on the Pricing Sheet

We have now completed the work of taking off the material for our typical simple job and are ready to list the items on the Pricing Sheet, Form 4.

You have already been advised to check every total on the preliminary sheets when it is transferred to another sheet. As the items are entered on the Pricing Sheet, check these also on the preliminary sheets with a red pencil. You will then have all totals on the preliminary sheets checked off when they have all been taken care of. This is important, for without the checking you will reach a stage where you will wonder whether you have accounted for all items and time will be wasted in going over the preliminary sheets to see if anything has been missed.

List the branch circuit conduit, outlet boxes, and pipe entrances first. The labor on these items is to be figured by using a unit time for each and then adding a percentage to the total time, so for convenience they should be placed together on the Pricing Sheet and three blank lines should be left below.

Next list all sizes of feeder conduit in order, then elbows, terminals, and bends. Pipe fittings should naturally follow—locknuts, bushings, condulets, hangers, etc., and then the wire. In

order to figure the labor on large wire, show under each size the "Runs under 150 lbs." and "Runs over 150 lbs." Follow next with switches, receptacles and plates, then cabinets, panelboards, pull-boxes, fuses, and miscellaneous items.

The exact order followed in listing the material is of minor importance, but it is important that you acquire the habit of following some regular order, because by so doing you are much less likely to leave things out.

The estimator usually prefers to secure prices from the jobber on the principal items of material for any job that amounts to more than a few hundred dollars. A complete material cost record is, however, a necessity in every contractor's office and will be used for pricing all material for small jobs.

The cost record may be in the form of a loose leaf book, cards in drawers, or cards attached to a metal frame so that the lower edge of each card is visible. One of the simplest forms of cost record and one of the best for a small organization is a loose leaf record designed by the Association of Electragists, International.

In any contracting organization, no matter how small or how large, one individual should be responsible for the material cost record. Even if the pricing and extending is done by some one else, the responsibility still rests on the estimator for seeing that the work is correct. Most price clerks and comptometer operators can be depended on to get the numerals right, but never trust any one but yourself on decimal points. You can very quickly run down a pricing sheet and make a mental calculation of each item which will show you whether or not the decimal point has been correctly placed, and this should always be done.

Following Through on the Lighting Contest

NOW that the Home Lighting Contest is history, the question in everyone's mind is how the industry may get a proper return on the time and money spent in making this the greatest single bit of good-will promotion ever entered into by commercial interests.

At the beginning of the contest the word of the electrical industry was pledged that the Contest would not be commercialized. For that reason plans for a follow-up on the contest are in a rather indefinite stage at the time of this writing. However something is going to be done; for the public, having

had its interest aroused, will want to learn more about the subject of lighting in the home, in the industrial plant, in the store and every place else where light is used.

How real this public interest in the subject actually is was shown during the contest when the Lighting Educational Committee received thousands of inquiries from school children, parents and teachers in towns where no local organization had been formed to carry on a contest. If a few pages of advertising in national magazines will bring this result, it is impossible to estimate what can be accomplished for good

lighting where the local electrical organizations are ready to meet the public halfway.

At the present time three plans are under way for the purpose of holding the attention that has been focused on lighting, and reaping the harvest that assuredly awaits the industry. One of these plans, already announced, is the Home Lighting Contest for central station employees which will be conducted by the National Electric Light Association. A second, tentative as yet, revolves around a plan for proper lighting of industrial plants. The third, which is still nebulous, would operate

"WE do not keep a horse and buggy simply because our father had one. Instead, we use the new and more serviceable means of travel. The man in the office, the factory manager, the contractor, all continually strive to find labor saving devices. They do away with antiquated apparatus and replace it with machines for increasing output. Greater production by the individual is a demand of the times.

"Yet when these same men reach their homes the thoughts of advanced methods and convenience seem left behind. They retain lighting equipment which was probably considered the best when it was installed, but which is now obsolete because of the developments in the industry and the knowledge of proper lighting learned from experience and investigation.

"Careful thought was given to the lighting of our house and has resulted, I believe, in our having a well lighted home. It is well lighted since each fixture was selected to provide sufficient light where it might be needed. A center light gives general illumination, while portable lamps placed by easy chairs for reading or sewing bring the light directly where desired. A shade in harmony with the fixture and the room covers each bulb, but all are dense enough to prevent glare or eye strain. Some are glass, some are silk and some are parchment, each being adapted to its surroundings. The base-



Julia S. Groo, of Portland, Ore., Whose Essay Won the \$15,000 Home in the Home Lighting Contest. Here is the Prize-Winning Essay

ment shades are metal.

"Small bulbs are used in decorative lamps to prevent annoying bright spots; frosted bulbs, where there is a possibility of their being seen with discomfort. Portable lamps are placed on each side of the mirror on the dressing tables and brackets on each side of the bathroom mirror to illuminate the features on both sides, thus avoiding shadows. The shades prevent a bright light from being reflected into the eyes.

"Each room has bulbs in excess of one watt per square foot, and since the walls are light, very little light is absorbed by them, thus avoiding the necessity of larger bulbs.

"The center fixture in the living room has two 150 watt bulbs. There are two

floor lamps and one table lamp, each containing two 40 watt bulbs. The brackets over the mantel and two small decorative lamps have a 15 watt bulb. Four single convenience outlets permit rearranging the furniture.

"A fixture with four 40 watt bulbs hangs 26 inches above the dining room table, while 15 watt candles are at each side of the buffet. A double convenience outlet is under the table and another by the buffet.

"Our kitchen is lighted by a 150 watt ceiling fixture with a 40 watt lamp over the sink. Appliances may be attached to a double convenience outlet.

"Each of the two bedrooms has a 40 watt lamp at the head of the bed. The three double convenience outlets make rearrangement of the furniture easy.

"The two 40 watt brackets by the bathroom mirror furnish sufficient light. The 40 watt center fixture is unnecessary because of the smallness of the room. The double convenience outlet is for appliances.

"The basement has 40 watt lamps in the trunk room, in front of the furnace and at the coal pile. A 100 watt lamp is over the laundry tubs. A double convenience outlet is available for appliances. Two 40 watt lamps should be placed over the work bench to prevent shadows on the work.

"Our long hall has a 40 watt ceiling fixture and a 40 watt bracket."

through contractors and fixture-dealers. None of these plans will in any way commercialize the good will created by the Home Lighting Contest, but merely open new avenues for carrying the message of good lighting to an already-interested nation.

In the N. E. L. A. contest prizes of \$500, \$300 and \$200 will be given by the association to employees of central stations for the three best essays on the subject of home lighting.

The association is conducting the contest as a result of reports from member companies that since the public contest, customers are showing a greater knowledge of good lighting than many employees have, due to the fact that children of employees were excluded from the previous contest. It is felt that in order to sell good lighting employees

Whether or not there will be a nationally-organized propaganda carried on through contractor-dealers has not yet been decided. The Illuminating Glassware Guild, in cooperation with the Society for Electrical Development, however, has already prepared material for a direct mail campaign to be conducted by retailers and designed to increase the sales of lighting equipment.

The campaign consists of 3 letters made up in standard packages of 1000 of each. A unit order, therefore, will be 3000 pieces.

The following plan has been worked out:

- (1) A standard package (3000 letters) can be purchased for \$50.00—5c per unit of 3 letters.



ought to know more about it than a customer does.

Practically the same rules for the employees' contest will be used as were in force in the public contest as the same literature will be employed. The main exception will be the fact that the employees will not have to write an essay such as was required of the children. This will make the contest simpler and assure a greater number of contestants. Local contests must be held by companies between Feb. 1 and Mar. 15. The winning primer will have to be at N. E. L. A. headquarters by April 15 and the winners will be announced at the N. E. L. A. convention in San Francisco in June.

While plans for commercial lighting activity have not taken definite form, it is probable that the Commercial Section of the N. E. L. A. will organize some activity along these lines. The work would take place in about 100 cities.

- (2) Arrangements can be made with glassware manufacturers to imprint the dealers' names. The price for this would be 6c per unit of three letters.
- (3) Dealers may also send a list of names to glassware manufacturers and the latter will imprint, stamp, fold, seal and return to the dealer for mailing from his local post office. The price in this case will be 10c per unit of three letters.

Some local contractor-dealer organizations and some individual contractor-dealers have already done follow-up work. In Salt Lake City the Rocky Mountain Electrical Cooperative League was addressed at a recent meeting by M. L. Cummings, Jr., of the Utah Light & Power Company on how the contest could be followed up without breaking faith with the public.

Mr. Cummings declared that the follow-up program should be built on

the effect of the contest rather than on the contest itself and suggested that the scope of the league's Lighting Service Bureau be enlarged to include educational work. However the bureau should remain strictly an advisory and engineering organization and not a selling organization.

However all this would be nullified unless the individual contractor studies new installations and proper wattage for homes.

Part of the 1925 program of the Rhode Island Electrical League is to establish a speakers' bureau, which will furnish speakers for all kinds of community affairs.

In Council Bluffs, Iowa, the local educational lighting committee, under the chairmanship of H. B. Florkee, has cooperated in the building of an electrical home in which proper lighting is emphasized. It will receive strong advertising and the committee has secured the cooperation of the Ladies' Aid Societies and similar organizations of the churches. Later on it is planned to place a man at the office of the central station to act in an advisory capacity for people seeking information on better lighting of homes, stores and industrial plants.

Here and there an individual contractor is doing some follow-up work on his own initiative. C. C. Miller, of Oneonta, N. Y., is using advertisements featuring home lighting.

This is tied in with his regular yearly fixture sale.

This follow-up work has already resulted in three wiring jobs and the sale of quite a number of additional receptacles for table and bridge lamps, etc.

It is the view of the contractor-dealer organization in Canton, Ohio, that individual dealers should do the follow-up work on the contest, while in Memphis the matter of a follow-up program is being considered by the Electragists' Association.

In any event the way has been prepared for the whole industry to feel the benefits of the tremendous good-will for lighting which has been created. The contest itself was not commercialized which made it doubly effective. But the effects of it—the greatly augmented public knowledge of good lighting—can and should be commercialized by follow-up work as effective as the campaign itself. Otherwise the industry will not be fulfilling its duty of service to the public.

What to Do When the Manufacturer Says "Don't Kill the Order"

A BANK job was let recently in one of our small eastern cities and with it went a wiring and fixture contract. The electragist who got the job happened to be one who has learned the lesson of costs—he had been burned once.

He got a price for the fixtures from the district representative of the manufacturer and marked it up 50 percent. The manufacturer's representative urged him not to mark up so strongly for fear he would "kill the order."

It is this policy of protecting the order with rock bottom prices which brings contracting businesses under the sheriff's hammer. This electragist knew how to answer the representative. He wrote a letter which is here reproduced that sums up the matter very well indeed. Other electragists are urged to do the same thing under similar circumstances. When you know your costs do not let the representatives of the manufacturers or the jobber tell you to shave the price to get the order and get away with it. Teach them that the secret of their success lies in your profit.

The letter follows:

Dear Mr. _____:

This letter authorizes you to go ahead with the fixture order for the _____ Bank & Trust Company of this city, at \$1565.75.

It may interest you to know that we closed with Mr. _____ this afternoon on a basis of a three thousand dollar (\$3,000.00) guarantee to take care of your fixture order and the other changes which they intend to make in their wiring system.

At this time I also wish to take exception to your letter of December 15th, in which you state "In giving this a little thought, permit me to say that I think it is a pretty long profit to put on, especially as there is no risk on collection—but that is up to you—don't kill the order."

Your fixture order was put through at a price of \$2350.00.

It would seem to me that it is hardly within your rights to suggest what is, or what is not, a fair margin of profit for a contractor and dealer to charge on a bill of goods he sells. The fact that this

particular order of fixtures was a large one does not necessarily mean that the selling expense was smaller in proportion to a bill of goods sold at a smaller list price. I believe I told you when you were here that I had been working for the last six months on this prospect and surely I am entitled to compensation for this time I have put in with this customer. It is also a fact that in dealing with a customer like this, who is president of a bank, it is necessary to have a standing in the community equal to his standing, so that you can talk to him on an equal basis. I believe I am also entitled to some additional compensation for being able to approach this customer on an equal basis.

For your information, I might also mention that it is necessary for us to install about \$3.00 worth of material to each dollar's worth of labor for us to show a profit. While in this particular job the labor on installing your fixtures will probably only run about \$100.00, on the balance of the work the labor

will probably run about \$400.00 to about \$100.00 worth of material, which shows conclusively that I must make my full percent of mark up on your fixtures to offset the rest of the work I have to do in the bank to make a complete job.

It also seems to me that, from your side of the fence, you should insist that the dealers, whom you tie up with, should make as large a profit as possible because they are then better financially situated to pay you your bills when they become due.

It has also been proved conclusively that the selling expense on the large orders is in the same proportion as the small orders, from the fact that concerns doing business running up into the millions of dollars a year have the same overhead percentage as the smaller dealer. In some cases this expense goes up as the business increases. Now, if the percentage were to be reduced on the large sales and the percentage of overhead expense remains the same, it would absolutely prove to me, whether it did to the rest of them or not, that I should not handle the large sales.

Of course, your comments did not affect the price I put on and sold to my customer, as I know what it costs me to do business, but I am afraid that if you make similar suggestions to other customers that they might listen to them, cut their prices and then wonder why they do not show a profit at the end of the year. And it is for this reason I am writing you this letter, that you carefully consider the costs of doing business and, if anything, suggest to the dealer that he increase his margin of profit rather than reduce it.

I hope you will take this letter in the spirit in which I have written it—to better the conditions of the dealer and give him a sufficient margin of profit to carry on his business successfully, to service properly the jobs he puts in and have something left to show a net profit at the end of the year.

Sincerely yours,

Protective Grounding

An analysis of good grounding requirements with special emphasis on the use of conduit both for protection and for decreasing effective grounding resistance

By J. W. BORDEN

Groundulet Company, Newark, N. J.

AT the present time grounding is almost universal and increasing attention is being given to it, because its merits are becoming more fully appreciated and partly because of the introduction of high tension distribution and transmission systems operating with grounded neutrals, because a cross between primary and secondary on such a system greatly increases the necessity for thoroughly adequate protection, and at the same time makes it more difficult to assure. The necessity is further increased by the increase in distribution voltages which have gradually increased from 1100 volts until today 6600 volts is not uncommon for distribution work and many installations are fed from 13,200 volt circuits.

There are many ways in which a high potential may be introduced on the customer's wiring. The insulation may fail on a transformer. The wires

tion and the same wire might be crossed with a primary several miles away.

When an excessive potential is introduced on the customer's wiring the possibility of a fatal accident is very great. Even though the high tension system is not operated with a grounded

magnitude depending upon the resistance of the circuit which it takes and the voltage. If these conduits, motor frames, etc. are intentionally grounded with a conductor of proper carrying capacity, no particular damage is likely to result other than the blowing of a fuse, thus removing the hazard entirely. However, if no definite ground path is provided a fire hazard of considerable magnitude exists. The current may traverse over metal lathing, small pipes of one kind or another and through other materials, some of which may be heated to a point where a fire is started; or the contacts in the different parts of the circuit may be, and are very likely to be such as to create an arc which generally increases in size and temperature very rapidly.

While the necessity and desirability of grounding secondary circuits is pretty well understood and quite generally carried out this is not so true of

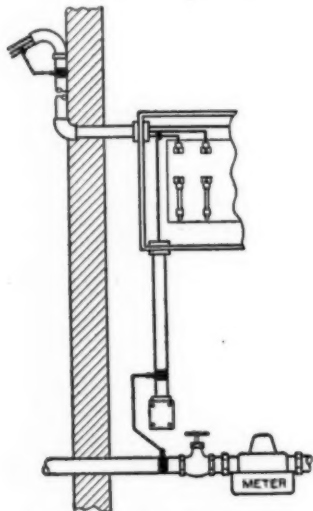


Fig. 1—Toledo Practice

may become crossed on the highway due to broken crossarms, excessive sag from a sleet load, the falling of heavy limbs or trees upon the lines or the crossing of the lines with other wires such as telephone and telegraph. In the latter case a secondary might be crossed with one of these wires at a given loca-

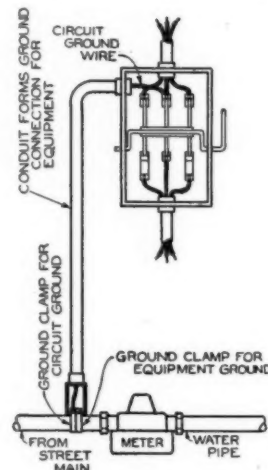


Fig. 2—Chicago System

neutral, there is almost invariably sufficient leakage to produce fatal results and if there were no leakage the capacity of most of our distribution systems is sufficient to produce the same result. The hazard should, of course, be removed by thoroughly adequate grounding and it is important not only that the proper grounding methods be used but that the ground conductors be installed in such a manner that the possibility of their being either accidentally or intentionally removed or disturbed or otherwise made ineffective is reduced to a minimum.

When a secondary system is grounded, either intentionally or otherwise, and one of the ungrounded wires for any reason comes in contact with the service entrance conduit or other conduits used for the wiring or the frame of a motor or other equipment, a current will tend to flow from the point of accidental contact to the neutral or other grounded wire of the system, its

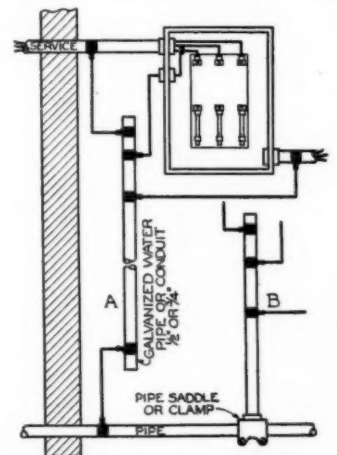


Fig. 3—Long Beach System

the grounding of the service entrance conduit. The National Electrical Code requires the service entrance conduit to be grounded except in those cases where it is insulated or guarded. This rule was formulated several years ago and at a time when metal service entrance switchboxes were not generally used. Under our present installation methods

it is hardly feasible to guard the service entrance conduit and switchbox, to which it is made up, and it is doubtful if there are many cases where the conduit can be said to be insulated, and most certainly not, if it is made up to a grounded switchbox and the grounding of the latter is a Code requirement. The fact seems to be, however, that a great many service entrance conduits are not being grounded and in fact this applies also to the switchboxes. There are so

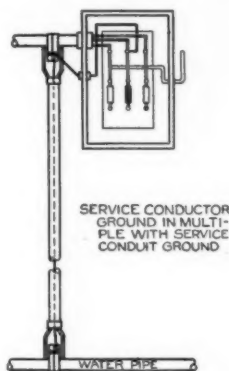


Fig. 4—Gary System

few cases, if any, where the grounding of the service entrance conduit may be properly omitted that it would seem advisable to make it the rule to ground all service entrance conduits.

In designing and installing a ground circuit, the following characteristics are highly desirable—

- (a) Adequate carrying capacity.
- (b) Minimum effective resistance to currents of all frequencies.
- (c) Resistance to mechanical injury.
- (d) Safety factor.
- (e) Permanency.

(a) Adequate carrying capacity may be assumed to be provided if copper conductors of the size specified in the National Electrical Code are used or their equivalent, but the carrying capacity stipulated must always be more or less of a compromise between adequacy and cost, as there are conditions under which Code size ground wires would not be adequate. If the copper conductors are placed in multiple with the containing protective conduit the carrying capacity is greatly increased, as it can be readily demonstrated that a 1/2 in. iron conduit has more carrying capacity than a No. 8 copper conductor.

(b) Assuming that a copper conductor is used and that it is protected by conduit, the minimum effective resistance, for the materials used, will be

obtained if the copper conductor and the conduit are connected in multiple. If they are not so connected, the effective resistance of the wire itself, contained within the conduit, will be greatly increased for 60 cycle current, by the choking effect of the conduit while for high frequency currents such as may be created by lightning disturbances, switching operations, swinging arcs, etc., such a conductor is not at all effective.

(c) Ground wires, at least for a part of the run, are generally installed on the side wall of cellars and brought down to the water pipe which is usually but a short distance from the cellar floor. From the very nature of things, a wire in such a location is subjected to mechanical injury probably to a greater extent than any other wire in the building. The run on the side wall should be protected by conduit securely fastened in place, and the conduit made up to the water pipe with a conduit type of ground fitting or a metal or wooden box provided to protect the wire and connections at the point of contact with the water pipe.

(d) In order to provide an adequate safety factor, the system should, if possible, be so designed that no one mechanical or electrical defect or injury will remove entirely the ground protection. If the ground conductor is composed of a copper wire within and in multiple with a conduit, an open circuit in either the conduit or the wire will still leave a fair amount of protection.

(e) In order to insure permanency, mechanical protection must be of the best, and all fittings and materials used must be of such a character that they will last at least as long as the system which they are protecting.

There are so many different methods of grounding in use that they cannot all be described in detail here, but some of the better systems are shown in Figs. 1 to 5, inclusive.

Fig. 1 shows a method in use in Toledo, Ohio. This method provides a ground conductor consisting of a copper wire in multiple with an electric conduit, the conduit at the same time acting as a protection for the wire. This conductor affords maximum carrying capacity and minimum effective resistance for the materials employed. Its less desirable features are, however, that the connection at the service head is not very accessible, the sides of the

main switchbox and the contacts established by the locknuts and bushings are used as part of the grounding circuit, and the mechanical protection at the water pipe is inadequate.

Fig. 2 shows the system used in Chicago. It will be noted that in this system there are two distinct ground conductors. The service is grounded through a copper conductor enclosed in an iron conduit. If the circuit is very long the choking effect of the conduit is liable to be serious and in any case the path provided is a very poor one for high frequency currents. The grounding circuit for the service entrance conduit contains part of the switchbox and the contacts established by two sets of locknuts and bushings, which is subject to considerable improvement. In this system, should one of the service wires become grounded on the service entrance conduit or on the main switchbox, the heavy short circuit current which would result would have to pass over the entire length of the protective conduit to the water pipe and for the most part, back over the copper ground conductor to the neutral. This circuit is obviously of much higher resistance than would be the case if a common ground conductor were used. This, of course, is characteristic of all grounding connections where two separate ground conductors are used.

Fig. 3 shows the system used in Long Beach, Cal. and surrounding territory. Here a piece of conduit or water pipe

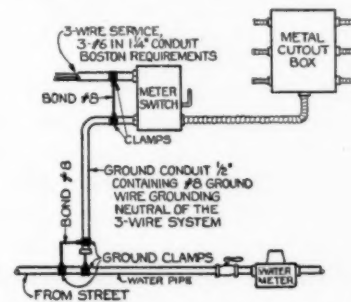


Fig. 5—Boston Practice

is used as the common conductor and the only conductor for grounding both the conduits and the service itself. The National Electrical Code and the National Electrical Safety Code do not permit the use of pipe or conduit for grounding the service itself and while it is an open question as to the merits of using this kind of a conductor, it would seem advisable to have a few more years experience with the use of conduit as a grounding conductor for

Radio Service Hints

Defective Prongs

Many a search for trouble in a receiving set has been a tedious job, when all that was the matter was that one of the tube prongs has not been in perfect contact with the springs of the tube socket. This is a small item but one of the most vital elements of the receiving set. In the case of contact of the filament prongs, it is easy to trace poor contact, because the filament will not light unless the contact is good and if it is poor the filament will flicker in such a manner as to give some guide to actual conditions. However in the case of the contacts made by grid and plate prongs, the tracing of trouble back to this source is not so easy. But making sure that all contacts are good is a simple matter, if the precaution is taken at the time when the set is in process of being installed.

Take the tube sockets to be used in the particular installation and insert the tube to be used in the socket for which it is intended. Unless the socket has a closed base, it will be an easy matter to ascertain, by looking through the bottom of the socket, just how the tube springs are making contact with the socket springs.

Keep the Dust Off

One dealer advises all his customers to keep a cloth over a receiver enclosed in a cabinet, when it is not in use. This will keep the dust off. Too much dust on the receiving instruments may result in bad reception. He also advises that when the receiver is dusted, that this be done very carefully, otherwise instruments may be put out of adjustment.

Precautions Against Acid

By way of ruining rugs, trousers, carpets and varnish, a storage battery can do a remarkable lot of damage unless certain precautions are taken to prevent the sulphuric acid from getting about. One dealer advises that the battery be kept on a small, specially constructed "stand" or else put in a waterproof box about one-half as high as the battery itself. Either of these things

The day of the radio fan is fast going by and the great public with no knowledge of radio or desire to know is buying sets. This is increasing the need for service and as a service to the electrical contractor this department is started. Here will be found each month a few short hints on trouble detection, prevention and removal.—The Editor.

will often save furnishings from being destroyed. A small rubber rug ought to be laid on the little stand before the battery is placed thereon to be put into service.

The trouble man should also bear in mind that the acid from storage batteries as used in radio can cause various skin diseases, although many fans seem to consider it harmless. It is a good plan to wash the hands thoroughly, when one gets through testing, filling or handling the battery. If acid happens to get on the rug or on clothes, a small amount of bicarbonate of soda will kill the acid almost immediately, thus preventing it from eating into the fibers of the cloth. If this powder is not available, a cloth sprinkled with pure ammonia will do the trick almost as well as the bicarbonate of soda.

Too Much Tickler

Too many turns on the tickle coil will cause the detector to spill over into oscillation too suddenly. Customers who are having trouble with regeneration should be advised that less turns of wire on the plate coil and the addition of a .001 mf. by-pass condenser will improve results. The by-pass condenser connects across the output terminals of the detector tube.

Space the Antenna

When a customer is having trouble with the music suddenly vanishing or becoming very faint, even on local stations, and no trouble can be found in the receiving set itself, it is well to examine the conditions of the antenna. In one case of this trouble the customer,

who lived in a flat building reported that he had gone over all the aerial connections and that the wire was stretched so that it did not swing. However the service man found that there were about ten other wires on the roof of the apartment and that the antenna were probably too close together. Tuning of another set threw the receiver out of adjustment by increasing or decreasing the effective capacity of the other antennae. The remedy used was to spread the wires as far from each other as possible, though the annoying effect could still be noticed somewhat if the wires happened to be any closer than twenty feet.

Care of Vacuum Tubes

The enormous production of vacuum tubes has necessitated possibly rather high speed inspection and from time to time quantities of poor or defective tubes get by the factory inspection. The interior mechanical construction of all vacuum tubes is not very strong and as a result if such poor or defective tubes are carelessly handled, the very fragile filaments may possibly come in contact with the grids, fuse some of the wires of the grids, which in turn come in contact with the plate, causing a short circuit of the tube.

The result is that the entire "B" battery voltage is shorted through the filament, the tube lights up for a second and then loses its value of \$4.00. Very often such a defective tube, when shorted, will also cause the burning out of other portions of the circuit or apparatus within the receiving set, making the whole receiver inoperative and necessitating service repairs.

Customers should be told to handle vacuum tubes very carefully, especially when putting them in and taking them out of their sockets. A little rough handling here may cost the customer the price of the tube, his temper and the good will he formerly had for his dealer. It is also a good policy always to see that the filament switch is in the "off" positions before placing the tubes into their sockets.

E. B. Murray, Fort Dodge, Iowa

The business career of E. B. Murray, head of the Hawkeye Electric Company, of Fort Dodge, is bounded on all four sides by the electrical industry and there are few things concerning the art of electrical contracting he does not know. He was born in Cochester, Ill., in 1880 and thirteen years later moved to Iowa with his family, Des Moines being the city of their choice. At the age of seventeen he went to work as electrician's helper for the Iowa Electrical Company, one of the first electrical contracting concerns in the state. There he stayed for three years and following that worked for a number of contractors in Des Moines, finally going with the Des Moines Electric and Brass Works in charge of the experimental department where he aided in the development of various machinery now in use industrially. For several years following this shop experience he travelled widely throughout the state on repair work of AC and DC motors and generators. In 1918 he went with the Citizens Electric Company of Des Moines as estimator and engineer, but a year later moved back to Fort Dodge, establishing his own business under the firm name of the Hawkeye Electric Company. The company does electrical contracting and repair work. Mr. Murray has been active in his state association. He was one of the foremost in bringing about the meeting last June at which the Iowa Association of Electragists was formed with a total of fifty members. He served as its first president and was instrumental in planning the association's initial program of activities.



Electragists You Should Know



C. E. James, Fort Pierce, Florida

Though he was christened Charles E., all his friends call him "Jesse" James. This can have no reference whatever to his real characteristics, for in the 12 years he has been in business in the Palmetto state he has gained the confidence and friendship not only of customers in his own hometown but all over the state. He was born in Port Arthur, Canada, in 1888 but five months later found it necessary to live on the other side of the line, his parents having moved to Sault Ste. Marie, Mich. In 1904 he began his electrical career with Ross & McClaren, contractors, in Sault Ste. Marie, receiving the sum of \$1.50 per week for his efforts. There followed a job selling tea, then one with the Edison Sault Electric Company doing successively line, meter and power plant work. Next he spent two years with a shipyard concern of the same city. The moving picture industry was just preparing for its sensational rise into prominence about that time and Mr. James laid plans to rise with it. He did for three years and then he heard of Florida. At the next writing he was there doing work for the City of Fort Pierce. Later the same year—1913—he established his own business there. He does a general contracting and merchandising business and also does plumbing contracting. In addition to being a member of the A. E. I., he belongs to the Florida Association of Electragists, of which he is at present secretary, to Rotary, International, to the Fort Pierce Chamber of Commerce and the Fort Pierce Merchants Association.

Information Others Have Asked For

Why the Switch is Not Placed in the Neutral

"In the new Code, as I understand it, the black wire must be run to the switch and back to the light. If this is correct, what is the reason for such a rule, when the white wire is the ground wire?"

ANS.—Rule 601-B, page 35, N. E. C., calls for the neutral to be a white wire. Rule 1204-A, page 92, states that a single pole switch should never be placed in any neutral wire.

The reasons for the latter requirement are first, that you should be able to clear any trouble which should occur in the fixture by opening the switch. If you had a ground on either wire or a short between the two wires in the fixture and the single pole switch was connected in neutral, then opening the switch would have no effect, the trouble would still continue, while if the switch is in the outside wire, when it is open the trouble would be entirely cut off. Second, if a ground develops in the neutral wire between the lamp socket and switch, the switch being connected in the neutral, the lamp will burn all the time regardless of whether the switch is open or closed.

Armored Cable Must Be Lead Covered for Use in Awnings

"The local City Department has refused to pass the use of standard armored cable for outside work in awnings and canopies, ruling that it must be lead covered. Is this ruling fair?"

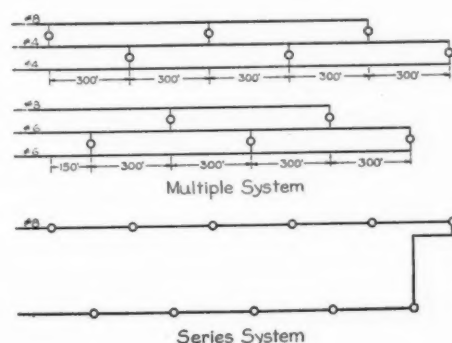
ANS.—We believe your City Electrical Department has ruled correctly in this case, because section 505 "D" of the National Electrical Code specifically states that the metallic armored cable must also have a lead sheath between the outer braid and the steel armor where installed in any place subject to moisture or dampness. The rule is intended to require armored cable to be lead covered when used outside of the main walls of any building in any place where it has not the protection which it would have within the building against

dampness and moisture resulting from extreme changes in temperature. The installation of lead covered armored cable is therefore proper in an awning or canopy such as you describe, the construction of which would not offer satisfactory protection against moisture, nor does it have the advantage of the warmer air around it that it would have on the inside of a building.

Wiring For Bridge Lighting

"Eleven lamp posts are to be installed on a bridge 1500 feet long, six posts on one side of the driveway and five on the other. The lamps are to be 200-watt at present, but may be changed at some future time to 400-watt. What method of wiring do you advise?"

ANS.—The 400-watt lamp is no longer listed. It is therefore assumed that



the wiring should be so designed that 500-watt lamps may be used.

A plan was first worked out for a multiple system to be supplied from one end of the bridge using 110-volt lamps. It was found that in order to keep within the limit of 5 percent voltage drop to the last lamp, two sets of 3-wire mains would be required, one set on each side of the driveway. For the six lamp side, two No. 4 and one No. 8 wires must be used and for the five lamp side, two No. 6 and one No. 8. Lead covered wire and galvanized conduit should be used, because the installation is exposed to the weather.

The wiring for a series system with 6.6 ampere lamps would be far less ex-

pensive. A transformer to operate such a system would cost approximately \$300. No cost estimates were made but it is probable that the entire cost of the series system including the transformer would be much less than the cost of the multiple system. The series system also has the advantage that all lamps burn at full candle-power regardless of their distance from the source of supply.

For this system, a pole-type constant current transformer would be required which would be connected on the primary side to the 2300-volt main, and would deliver on the secondary side a constant current of 6.6 amperes. As approximately equivalent to the 200-watt and 500-watt multiple lamps, 4000-lumen or 6000-lumen 6.6 ampere series lamps would be used.

A single No. 8, 600-volt insulated and lead covered wire should be installed in a 1½ in. conduit running out on one side of the bridge crossing over and returning on the other side, with a loop to each lamp post. Cast iron junction boxes opposite to the posts would also be required for this system. Loops from the junction boxes to posts would be run in 1 in. conduit. The great saving over the multiple system in the cost of the wiring will be readily appreciated.

Small Repair Work Cost Records

"Is it necessary to use the Job Envelope in the Standard Accounting System on small repair jobs such as door bells, flat irons, etc., where little, if any, material is used and very little labor is required?"

ANS.—Our Job Record Sheet (described on page 19, August, 1924) is designed for the purpose of keeping cost records of exactly the class of work you mention. It is true, as you say, that there is a considerable waste of time and money in using a Job Envelope and the other necessary forms of our Standard Accounting System for keeping the cost record of very small jobs. You will find the Job Record Sheet, however, to be entirely suitable.

The Electragist

Official Journal of the
Association of Electragists—International

S. B. WILLIAMS
Editor

H. H. STINSON
Associate Editor

Safety Not Cost

Hearings are being held by Article 5 Committee, National Electrical Code, Wiring Methods, for the purpose of gathering views for and against a new system of wiring which contravenes certain sections of the Code. It will be necessary to amend the Code in these sections in order to permit the use of this material.

One of the reasons which have been advanced in favor of this material is that it may cost less to wire a building with it than it will with any other material. To our mind this is a point which should not even be given consideration by the committee.

There is but one thing to be considered—Safety. If this new material will provide wiring that is safer than anything now permitted we urge the amendments necessary to permit its use, but if it does not provide a form of wiring safer than anything we now have we urge its rejection.

Beware of Very Low Overhead

It is never easy to help the man who says, "Well, maybe I'm wrong, but I put away some money in the bank this year." Such men are lucky and so long as the breaks are in their favor they will make a profit. They do not seem to realize, however, that they are skating on thin ice.

These are the men who think they know their costs and don't. A large contractor mentioned the other day that his overhead was around 8 percent. He was estimating on that basis and adding from 5 to 10 percent for profit, depending on the job.

An analysis of his overhead revealed, however, that he did his own financing by maintaining a very large bank balance—but never charged any financing cost into his overhead. He carried a very large stock of materials and tools and never charged interest. He rented part of his building to others, the income paying all of the carrying charges including reduction of principal. He figured he had no rent to pay and so charged none up. He paid himself a salary but it was only enough to pay his household expenses—he had other income from investments which took care of his personal wants.

This man is giving his customers in excess of \$10,000 a year. He sees it one minute, but the next he sees a bank profit at the end of the year although he admits that a serious trouble on a single job might wipe out this profit.

He has come to believe so strongly that his overhead is around 8 percent that he has taken a tremendous volume of

business. Much of this of course has come by virtue of his low bids. Were he to increase this overhead figure to its proper amount and then add a reasonable profit he would probably find his volume cut perhaps in two, but the probabilities are that he would put at least the same amount of money in the bank at the end of the year, besides having the satisfaction of knowing he had to work only half as hard for it.

Because one doesn't have to draw a check to cover an item is no reason for believing that there is no cost involved. Every item for which you would have to pay were somebody else to do it, is a charge to which you are entitled and if left out of the overhead is a gift to your customers, most of whom are better able to pay a fair price than you are to make them a gift of such generous proportions.

Motor Ratings on Name Plates

The limit of the load that a motor will pull safely is, of course, determined by the temperature rise of the windings. When this temperature goes beyond a certain point, the insulation begins to break down and sooner or later a short occurs.

In places where there is a moving supply of fresh, cool air, the motor will carry more current before it reaches this maximum temperature, than if the motor were used in a warm place with little or no supply of fresh air.

The same motor, in other words, will have different horsepower overload capacities when used under different temperature conditions.

For that reason the manufacturers are being asked to show on the name plate the maximum horsepower rating under the most favorable conditions. To this we most vigorously protest.

No matter what the normal rating is, a buyer will see only the maximum and will buy with that in mind. Then when the motor fails to measure up to that rating under the conditions in the buyer's plant, the contractor will be called in to service, without cost, the job he installed. Not only will he lose the cost of the labor but he will in all probability incur a certain loss of good will with that customer—a loss of confidence because the job didn't turn out right.

We see no reason why a few people who can use the information intelligently, should not be able to find out the economical size of motor to use under extraordinary conditions; but to publish this information on the name plate is too much like inviting trouble.

Year 'Round Employment

President Coolidge told the general contractors last month that the government would welcome anything done to spread employment over twelve months in the construction industries. This means the electrical as well as the others.

On new work the electrical contractors are dependent upon others and except by quoting organization-holding prices such work cannot be stimulated. But the electrical contracting industry is fortunate—both large and small concerns—in that it does not and, as long as any of us are living, will not have to depend on new work.

There is more rewiring than new wiring to be done and we commend this field to the contractors. It will help smooth out the valley of dull periods in new construction.

Butter Choked the Cat

There is an old saying that you can choke a cat to death with butter. It came to mind the other day when we heard a rather sad story of the wreck of a contractor's business through an act of kindness.

He was a small contractor, doing his own work and enjoying a reputation for clean, neat and thorough work. One of the women for whom he worked urged her husband to let this contractor have some work at the factory—and he did. It was a \$35,000 job, as the young fellow figured it.

Soon he found that other men did not work as fast as he did. He found he needed ladders and tools that he didn't have. He found that the job was taking all his time and he couldn't take care of his regular trade. In short before long he found that what looked like a nice job with a nice profit was a wrecker. He finished the job and his own meagre capital at the same time and went back to working for someone else.

The business lost a small contractor who might have developed but through kindness he started to spread too fast and over too much country. He learned the lesson "never to bite off more than you can chew—comfortably."

Go to the Bank

The bank is a commercial tool that more contractors should learn to use. There is apt to come a time when more money is needed to finance some work and if a bank credit has not been established the job might have to go to someone else.

The time to establish a bank credit is when you don't particularly need the money. The best scheme, because it is profitable, is to borrow from the bank so as to take advantage of the cash discounts. One seldom needs the money more than a few days and the rate is only six and in some places seven percent per annum. Cash discounts are 2 percent or more of the gross.

When you do borrow in this way from the bank on a ten, twenty or thirty day note always take the note up at or prior to maturity. In this way you establish a practice and you establish a credit. When you later really need money on a six month's note you will have less difficulty in getting what you need.

Moreover, a contractor working with the bank's money will find that his own capital will go farther and that it will not be necessary to tie so much of it up in frozen stocks and supplies.

Success

We have heard much loose talk about contractors falling short of being successes. We have our own idea of what constitutes success but let us take the average man's notion—wealth.

There is a small electrical contractor in New York who seldom does much over twenty-five thousand a year. For years he has put between one and two thousand dollars in the bank. Today after a quarter of a century in the business he has probably between forty and fifty thousand dollars. Is he a success?

What made him successful? Putting money in the bank each year. His profit was never large in any one year, but, Oh, how nice it is, now that he is at the time of life when he can retire and still feel young enough to play!

Self Satisfied

The sense of locality is strong in many parts of the country but every now and then it gets so strong that it virtually insulates the community from any good idea born elsewhere.

Both Florida and California have the home sense highly developed but never to the point of disregarding the progress of the rest of the country. Sound ideas developed elsewhere always find a welcome there. Both of these States have taken the Electragist idea and through strong state associations are building locally along national lines.

Milwaukee has found it possible to make greater strides by using the Standard Accounting System in its local development rather than going it alone with some system developed locally.

There are other examples that might be mentioned where local leaders have recognized the value of things on which the best minds the industry had set their stamp of approval.

There are other cities where just the opposite prevails—where the leaders seem to feel that their very job depends upon the inventions of their own minds—where, disregarding the charted roads, they set off afield determined to be pioneers.

Why is it that things which the industry after deliberation has agreed upon are so readily disregarded by these localities? Why, for instance, do they have to go to all the trouble of writing their own Electrical Code when a National Electrical Code exists? Why, with a Standard Accounting System developed for contractors and dealers by the best accounting minds in the entire industry, do some localities ignore it and promote some other native system? Why do we find some cities developing their own system of estimating when a system tried and tested nationally is available?

Why are there some cities so self satisfied?

Association of Electragists INTERNATIONAL

PRESIDENT, James R. Strong
526 West 34th Street, New York City.

SECRETARY AND TREASURER, Laurence W. Davis,
15 West 37th Street, New York City.

GENERAL COUNSEL, Franz Neilson,
New York City.

EXECUTIVE COMMITTEEMEN

Eastern Division W. Creighton Peet, 70 East 45th Street, New York City	Mountain Division E. C. Headrick, 87 Broadway, Denver, Colorado
Southern Division J. A. Fowler, 118 Monroe Avenue, Memphis, Tenn.	Eastern Canadian Division R. A. L. Gray, 85 York Street, Toronto, Ont.
Great Lakes Division E. McCleary, 2470 Grand River Avenue, W., Detroit, Mich.	Western Canadian Division J. H. Schumacher, 187 Portage Avenue, Winnipeg, Man.
Central Division A. Penn Denton, 512 South West Blvd., Kansas City, Mo.	Open Shop Section J. F. Buchanan, 1904 Sansom Street, Philadelphia
Pacific Division C. L. Chamblin 687 Mission Street San Francisco, Calif.	Union Shop Section L. K. Comstock, 21 East 40th Street New York City

AT LARGE

James R. Strong
526 W. 34th Street
New York City

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Conventions and Meetings James R. Strong 526 W. 34th St., New York City	Membership James R. Strong 526 W. 34th St., New York City
Cost Data Arthur L. Abbott 15 W. 37th St., New York City	Trade Policy (Covering Manufacturers, Central Stations, Jobbers and Merchandising) W. Creighton Peet 70 E. 45th St., New York City
Electragists' Data Book J. A. Fowler 118 Monroe Ave., Memphis, Tenn.	U. S. Chamber of Commerce L. K. Comstock 21 E. 40th St., New York City
International Relations R. A. L. Gray 85 York St., Toronto, Can.	

Past Presidents of the National Electrical Contractors' Association

Charles L. Eidlitz.....1901-1903	Gerry M. Sanborn.....1908-1910	John R. Galloway.....1914-1916
E. McCleary1903-1905	*Marshall L. Barnes.....1910-1912	Robley S. Stearnes.....1916-1918
James R. Strong.....1905-1908	Ernest Freeman1912-1914	W. Creighton Peet.....1918-1920

*Deceased

CHAIRMEN AND SECRETARIES OF STATE ORGANIZATIONS

State	Chairman	Secretary	State	Chairman	Secretary
British Columbia:	P. F. Letts 3044 Granville St., Vancouver	J. Hart 323 B. C. Elec. Bldg., Vancouver	Michigan:	W. F. Fowler c-o Barker-Fowler Electric Co., Lansing	E. P. Blackman c-o Motor Shop Battle Creek
Alabama:	J. R. Wilcox 313 N. 19th Street Birmingham	D. B. Clayton Am. Trust Bldg., Birmingham	Missouri:	A. J. Dunbar Frisco Bldg., St. Louis	G. E. Haarhaus St. Louis
California:	Victor Lemoge San Francisco	Walter F. Price 318 Call Bld., San Francisco	Mississippi:	W. J. Johnson Meridian	A. H. Jones McComb
Colorado:	W. A. J. Guscott 1100 California St., Denver	E. A. Scott 615 Fifteenth St., Denver	New Jersey:	Henry M. Desaix Paterson	Robert Beller Newark
Connecticut:	N. B. Fitch New Haven	Wilbur M. Peck 264 Gr'nwich Av., Gr'nwich	New York:	C. C. Miller Oneonta	H. F. Janick 29 St. Paul St., Rochester
Florida:	Preston Ayers Orlando	Charles E. James Fort Pierce	N. & S. Carolina:	N. L. Walker Raleigh	W. P. Christian Greensboro, N. C.
Indiana:	T. F. Hatfield 102 S. Meriden St., Indianapolis	A. I. Clifford 507 Odd F. Bldg., Indianapolis	Ohio:	C. L. Wells Akron	O. A. Robins 1517 Franklin Ave., Columbus
Iowa:	R. Honneger 516 W. 3rd St. Des Moines	C. E. Gourley Cedar Rapids	Pennsylvania:	F. Lloyd Smith 250 Wyoming Av., Scranton	M. G. Sellers 1202 Locust St., Philadelphia
Kansas:	R. M. Sutton 123 N. Market St., Wichita	Charles Dalrymple Wichita	Tennessee:	Emmett Scott 115 W. 7th Street, Chattanooga	J. A. Fowler 118 Monroe Ave., Memphis
Louisiana:	Robley S. Stearnes 24 Carondelet St., New Orleans	I. G. Marks 406 Mar. Bk. Bldg., New Orleans	Texas:	T. L. Farmer 1809 Main St., Dallas	J. W. Read 715 Capitol Ave., Houston
Maryland:		G. S. Robertson 417 Park Bk Bdg., Baltim're	Wisconsin:	L. W. Burch 202 E. Wash'n Ave., Madison	H. M. Northrup 25 Erie St., Milwaukee

List of Local Associations

STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS	STATE AND CITY	LOCAL SECRETARY	STREET ADDRESS
ALABAMA			NEW JERSEY		
Birmingham (C)	J. R. Wilcox	2017 First Avenue	Long Branch (C) (Asbury Park and Red Bank)	Austin Hurley	Campbell Ave., Long Branch
CALIFORNIA			Newark (C)	John Caffrey, Jr.	435 Orange Street
Fresno (C)	Clyde L. Smith	1162 Broadway	Paterson (C)	R. Marshall	479 Market Street
Long Beach (L)	V. Ringle	So. Cal. Edison Co.	Philipsburg (See Lehigh Valley, Pa.)		
Los Angeles (C)	Helen I. Mikesell	1009 1/2 S. Hill St.			
Oakland (C)	Laurence R. Chilcote	Builders' Exchange			
San Francisco (C)	E. E. Broune	522 Call Building			
COLORADO			NEW YORK		
Colorado Springs (C)...	Matt Whitney	208 N. Tejon St.	Brooklyn (C)	H. F. Walcott	58 Third Avenue
Denver (C)	Edwin A. Scott	615 Fifteenth Street	Jamestown (C)	Henry M. Lund	309 Main Street
Pueblo (C)	E. F. Stone	So. Colorado Power Co.	Nassau-Suffolk (C)	Henry T. Hobby	55 Front Street, Rock- ville Centre, L. I.
CONNECTICUT			New York City		
Hartford (C)	A. A. Angello	473 Park Street	Section No. 1 (C)	M. J. Levy	70 East 45th Street
Waterbury (C)	D. B. Neth	107 West Main Street	Independent (C)	Albert A. A. Tuna	127 East 34th Street
DIST. OF COLUMBIA			Oneonta (C)	B. B. St. John	433 Chestnut Street
Washington (L)	R. W. McChesney	Munsey Building	Rochester (C)	Theo. T. Benz	278 State Street
FLORIDA			Schenectady (C)	Richard Spengler	421 McClellan Street
Jacksonville (C)	W. H. Secrist	c/o Bay-Secrist Elec. Co.	Syracuse (C)	Fred P. Edinger	802 East Water St.
Miami (C)	E. A. Robinson	118 N. W. First Ave.	Utica (C)	W. C. Balda	228 Genesee Street
GEORGIA			Yonkers (C)	Louis Mayer	485 South Broadway
Atlanta (L)	W. W. Barr	75 Marietta Street			
Savannah (L)	Sylvan M. Byck	Byck Electric Co.			
ILLINOIS			OHIO		
Chicago			Akron (C)	E. C. Rishel	540 East Avenue
Electrical Contractors' Association	J. W. Collins	160 No. LaSalle St.	Canton (C)	H. A. Hastings	301 New Vickery Bldg.
Master Elec. Contractors' Association	F. J. Boyle	175 W. Washington St.	Columbus (L)	Ernest A. Sims	37 East Main Street
Decatur (C)	Earl Weatherford	114 East William St.	Cleveland (C)	Frank T. Manahan	c-o Elec. Cont. Assn., Statler Hotel
Peoria (C)	L. B. Van Nuys	238 So. Jefferson St.	Dayton (C)	Clarence Carey	1107 South Brown St.
Rockford (C)	Donald Johnson	106 North Second St.	Marion (C)	F. D. Mossop	147 South Main St.
Springfield (C)	A. D. Birnbaum	916 West Cook St.	Massillon (C)	O. H. Cornwell	c-o Mesco Electric Co.
INDIANA			PENNSYLVANIA		
Gary (C)	A. B. Harris	570 W. Washington St.	Allentown		
Indianapolis (C)	R. E. Snyder	704 No. Alabama St.	(see Lehigh Valley) ..		
Terre Haute (C)	C. N. Chess	523 Ohio Street	Bethlehem		
IOWA			(see Lehigh Valley) ..		
Davenport (C)	Louis F. Cory	510 Brady Street	Catasauqua		
Sioux City (C)	E. A. Arzt	211 Fifth Street	(see Lehigh Valley) ..		
Waterloo (C)	R. A. Cole	Cole Bros. Elec. Co.	Chester (C)		
KANSAS			Du Bois (C)	W. H. McMillan	12 West Third Street
Salina (C)	G. R. Pizarro	146 So. Santa Fe St.	Easton	C. E. Blakeslee	Du Bois
Wichita (C)	P. W. Agrelius	Wichita	(see Lehigh Valley) ..		
KENTUCKY			East Stroudsburg		
Louisville (C)	C. L. W. Daubert	921 South Third St.	(see Lehigh Valley) ..		
Paducah (L)	K. H. Knapp	c-o Paducah Electric Co.	Emans		
LOUISIANA			(see Lehigh Valley) ..		
New Orleans (C)	S. J. Stewart	866 Camp Street	Hellertown		
Shreveport (C)	R. L. Norton	620 Marshal Street	(see Lehigh Valley) ..		
MARYLAND			Lehigh Valley (C)	A. W. Hill	Main and Market Sts., Bethlehem
Baltimore (C)	George S. Robertson	417 Park Bank Bldg.	Northampton		
MASSACHUSETTS			(see Lehigh Valley) ..		
Haverhill (C)	H. W. Porter	14 West Street	Palmerton		
Malden (Medford, Ever- ett and Melrose) (C) ..	H. J. Walton	c-o Malden Electric Co.	(see Lehigh Valley) ..		
Springfield (C)	A. R. Tullock	11-12 Court House Place	Philadelphia (C)	M. G. Sellers	1202 Locust Street
Worcester (L)	John W. Coghlin	259 Main Street	Pittsburgh (C)	Fred Rebele	1404 Commonwealth Bld.
MICHIGAN			Slatington		
Grand Rapids (C)	T. J. Haven	1118 Wealthy St., S.E.	(see Lehigh Valley) ..		
Saginaw (C)	E. T. Eastman	209 Brewers Arcade	Wilkes-Barre (L)	Ambrose Saricks	25 No. Main Street
MINNESOTA			SOUTH CAROLINA	J. P. Connolly	141 Meeting Street
Duluth (L)	Morris Braden	c-o Minn. Power & Light Co.	Charleston (L)		
Minneapolis (C)	W. I. Gray	209 Globe Building	TENNESSEE		
MISSOURI			Chattanooga (L)	P. W. Curtis	725 Walnut Street
Kansas City (C)	A. S. Morgan	4 E. Forty-third St.	Knoxville (L)	Jerry G. Pason	303 West Church St.
St. Louis	W. F. Gersner	120 No. Second St.	Memphis (L)	J. J. Brennan	12-16 So. Second St.
Electragists' Ass'n (C)	G. L. Gamp	Wainwright Bldg.	Nashville (C)	J. T. S. Lannon	c-o Electric Equip. Co.
Electric Employers' Association (C)					
NEBRASKA			TEXAS		
Lincoln (C)	G. G. Kingham	142 South Twelfth St.	Beaumont (C)	J. A. Solleder	Houston & Bolivar Sts.
Omaha (L)	Israel Lovett	c-o City Hall	Dallas (C)	P. B. Seastrunk	2032 Commerce St.
			Houston (C)	J. W. Read	715 Capitol Avenue
			UTAH		
			Salt Lake City (C)	C. Lamont Felt	18 West Second St.
			VIRGINIA		
			Lynchburg (C)	J. L. Fennell	c-o Fennell & App
			Norfolk (L)	K. D. Briggs	227 Arcade Bldg.
			WASHINGTON		
			Seattle (L)	P. L. Hoadley	Seaboard Building
			WISCONSIN		
			Green Bay (C)	V. E. Grebel	531 S. Broadway
			Madison (C)	Otto Harloff	602 State Street
			Milwaukee (C)	W. F. Baumann	156 Fifth Street
			CANADA		
			Montreal (C)	George C. L. Brassart	674 Girouard Ave.
			Vancouver (C)	James Hart	323 B. C. Electric Bldg.
			Winnipeg (C)	Sydney F. Ricketts	76 Lombard Street

(C) designates exclusively Contractor-Dealer organization.
(L) designates an Electrical League.

JANUARY ACTIVITIES

Home for New York Electrical Trade Again Proposed



The Twenty-first Annual Banquet of the Independent Associated Electrical Contractors and Dealers of Greater New York, Held at Hotel Astor, January 13

A new impetus was given to the proposal that New York have a real electrical office building and club, by Charles I. Eidlitz, chairman of the board of the New York Electrical Board of Trade, in an address before the Independent Associated Electrical Contractors and Dealers' Association of Greater New York, on January 13 at the Hotel Astor. He suggested that such a building be erected as a memorial to the great Thomas A. Edison. It is Mr. Eidlitz's suggestion that such a building be built now as a testimony to the achievements of Mr. Edison while he is still alive.

The plan provides for show rooms, museum, offices for the Electrical Board of Trade and manufacturers, hotel rooms and a restaurant to be used as a luncheon club. It is proposed to issue bonds and at the meeting the Association voted to subscribe for the first bond.

The meeting, which was for the purpose of installing the new officers whose election was announced in last month's issue, followed the annual dinner.

The incoming president, L. C. MacNutt, outlined the program for next year, which includes estimating, sales-

manship and business management topics.

Louis Freund, the retiring president, was presented with a strikingly handsome silver loving cup, in recognition of his fine services during the year.

Other speakers included: Joseph Forsythe, N. Y. B. F. U.; Simon Rasch; Theodore Josephs; J. P. Ryan; and John McIntyre. A. Lincoln Bush acted as toastmaster.

Dealers to Give Fixture Show

Although the National Council of Lighting Fixture Manufacturers definitely decided at their meeting in Philadelphia, January 13, that no fixture show would be given under their auspices this year, there will be a fixture exposition. It will be given during March by the National Association of Lighting Equipment Dealers, according to an announcement made by R. W. Smith, secretary.

"Although the National Council has decided not to give a national or regional show this year," the statement read, "the lighting equipment dealers' organization feels that a show is necessary because of the requests we have received from the majority of our mem-

bers to hold a market in conjunction with our annual convention about the middle of March. The definite date and location will be announced later."

This action by the dealers was decided on at a meeting of the board of directors on January 15, immediately following the announcement of the manufacturers' adverse decision on the show.

Louisiana Body Elects

Colonel Robley S. Stearnes was re-elected president of the Louisiana Association of Electragists at the annual meeting of that body in New Orleans, January 5. Colonel Stearnes has long been prominent in state and national activities, having served as president of the A. E. I. from 1916 to 1918.

The other officers elected at the meeting were: vice-president, Abry Cahn, Cahn Electric Company, Shreveport; treasurer, Walter C. Joubert, 351 Main street, Baton Rouge; secretary, I. G. Marks, 323 Chartres street, New Orleans.

Wiring Methods Committee Meetings

Two meetings for the purpose of discussing certain proposed new practices in open and concealed wiring methods are being held by the Committee on Article 5, National Electric Code, Wiring Methods. The first takes place as this issue goes to press, on January 30, at the Brown Hotel, Louisville, Ky. The other is scheduled for February 2, at the rooms of the New York Board of Fire Underwriters, 123 William Street, New York City.

At these hearings the views of those favoring or opposing the proposed new wiring methods will be heard. These practices involve the use of special assemblies of single, twin and multiple conductor cables or wires with special coverings, for the recognition of which in the National Electrical Code, amendments to sections 501-i, 502-c, 502-e, 502-i and 611-r, have been presented for consideration and adoption as these practices do not conform to present wiring standards.

President Coolidge Talks to General Contractors

Trade associations are entitled to all encouragement, President Coolidge told the Associated General Contractors of America last month, provided they are devoted to useful ends. A number of such useful movements he pointed out to the contractors.

One was the development of a uniform contract form which promises much, he said, "as an assurance of fair treatment to all competitors and in securing the best work."

Considerable emphasis was placed on the worthwhileness of formulating plans for all year round employment in the construction industries.

The President took occasion to warn the contractors against restricting prices saying "there is ample opportunity for good and useful results through organization without overstepping the boundaries of public interest, honest competition and fair dealing."

Philadelphia Contractors Elect

At the annual meeting of the Philadelphia Electrical Contractors' Association, officers for 1925 were elected as follows: President, Louis W. Moxey; vice president, F. M. Shepard; additional directors, J. F. Buchanan, Edgar J. Ellis, Arthur M. Woodfield. M. G. Sellers was reelected secretary-treasurer.

Portable Device Safety Standard Expected Soon

A safety standard for portable electric devices is expected to be issued soon, according to a report submitted to the annual meeting of the Electrical Safety Conference in New York on January 21. The committee on rotating electrical machinery has drawn up this standard and it will shortly be forwarded to the members of the conference.

A review of the year's activities, according to the report submitted by Robert B. Shepard, secretary of the conference, shows that work on a number of standards is progressing favorably. In addition to the portable device standard, a safety standard on panelboards is in preparation. A standard for enclosed switches, which has been in course of preparation for four years, is now almost completed and there is also

being prepared one for elevators as a supplement to the safety standard for industrial control equipment.

The meeting indorsed unanimously a resolution adopted by the National Safety Council, pointing out the desirability of having all foreign-made electrical and gas toys, decorations and heating and cooking utensils meet the standards of similar articles of American manufacture before being sold.

Officers elected for the coming year are: chairman, A. R. Small; vice chairman, R. W. E. Moore; secretary-treasurer, Robert B. Shepard.

Special Los Angeles Meeting for Davis

A general reorganization of the Southern California contractors and dealers associations is hoped to result from a special meeting of contractors and dealers called in Los Angeles for February 11, at which Laurence W. Davis, secretary, A. E. I., will talk on the benefits of a strong tie-in of local, state and national bodies.

H. L. Walker, who is acting as chairman of the temporary organization which is calling the meeting, has announced that more than a hundred contractor-dealers from the Southern California section will be present.

Following this meeting, Mr. Davis will go to Sacramento to attend the first

quarterly meeting of the California Electragists on February 14.

Toronto Plans Contractor-Dealer Helps

A greatly enlarged service for its contractor-dealer members will be put under way in 1925 by the Electric Service League of Toronto, according to the plans just approved by the board of directors.

In addition to the services given previously the league proposes these extensions and improvements:

1. Special certificates of membership, bearing the Red Seal, for display in office or store.
2. Names of members to be put in large, bold letters on Red Seals on houses.
3. Participation in Red Seal publicity campaign to be organized in the spring.
4. Names in Red Seal booklet to be printed in the spring for circulation to all builders.
5. Participation in old house re-wiring work, to begin development of which the league board has passed an appropriation.
6. Advertising signs at cost.
7. Creation of an advisory council of six to be elected by 1925 members, to assist in bringing the contractor-dealer part of league work to better basis.

A. E. I. and Great Lakes N. E. L. A. to Meet Simultaneously

An unusual opportunity for members of the Association of Electragists—International, to become acquainted with the central station viewpoint and in turn to express their views to central station operators, will be presented at the 1925 annual convention at West Baden. This is the result of the decision of the Great Lakes Division of the National Electric Light Association to hold its 1925 meeting at French Lick Springs, a short mile from West Baden, on a date coinciding with the Electragist convention.

This idea, when presented to the meeting of the conference delegates of the Great Lakes Division, was unanimously approved and it was the consensus of opinion that such an arrange-

ment would add a great deal to both conventions.

Reservations had been made by the central station men at French Lick for September 30 to October 3, but this was changed and reservations were made for September 23 to 26. It is thought that the date of the Electragist meeting may be moved up one day, so that the two conventions will coincide exactly.

Joint entertainment plans will probably be worked out at a later date and much satisfaction has been expressed at the mutual benefits that will be derived from the opportunity the power company operators will have in viewing the manufacturers' exhibit at the A. E. I. convention and the opportunity of the electragists to meet so many of central station men personally.

Point of Adequacy of Union Labor Referable to Council

WHILE referring specifically to relations between New York employees of union men and labor the decision of the Council on Industrial Relations, dated December 4 but released only a few days ago, lays down many important fundamentals which are expected to have great weight as precedent.

Undoubtedly the most important point in the decision was that the Council held that the question of acceptance by the union of membership in the union of hitherto non-union men when their employees decided to change to closed shop was properly referable to the Council. The employers of the city felt that the number of union men was totally inadequate. The union claimed that the question of its acceptance of men in the union was not properly referable to the Council.

Another important point is the reaffirmation of the principle that there shall be no restriction or interference with the use of machinery, tools, appliances or methods.

L. K. Comstock, being an interested party, E. McCleary of Detroit was chosen as chairman. M. H. Johnson of Utica acted as secretary. Others present at the hearing which was held on December 3 and 4, were Messrs. Bugniazet, Ford, Hixon, Kelly and Meade.

There appeared for the Local Union, No. 3, Messrs. O'Hara and Goodbody and for the Electrical Contractors' Association and the Electrical Board of Trade, Messrs. Strong and Ryan.

The five points referred to the Council are:

- (1) The method to be pursued by business agents in case irregularities are discovered.
- (2) The assignment of apprentices.
- (3) The cutting and threading of nipples in electric meter work.
- (4) The designation of employees on overtime work.
- (5) The maintenance of temporary wiring for light and power.

The Council unanimously decided as follows on these points:

1 (a) "When a sympathetic strike is to be called, members of the Union shall not be ordered out until the next quitting time, either noon or night of work-

ing day. Business agents shall at once notify the Chairman of the Union Section Contractors' Group, Electrical Board of Trade, if the employer involved is a member thereof; or the Secretary of the Electrical Contractors' Association, if the employer involved is a member thereof, giving the name of the employer, names of Union members called out, location of job and nature of grievance.

(b) "In case of alleged violation of rules or agreements by any party thereto who is a member of the Union Section Contractors' Group, Electrical Board of Trade, or of the Electrical Contractors' Association, no strike action shall be taken until the violation has been acted upon by the Joint Trade Board, in accordance with the agreement.

(c) "No action intended to discipline a member of the Union, which also penalizes the Employer shall be taken, except in accordance with the determination of the Trade Board.

(2) "Apprentices may do Helpers' work only when the Union fails to supply the Helpers required. With this exception, apprentices may be assigned by the Employer without restriction.

(3) "Article 22 of the existing Agreement between the Electrical Contractors' Association and the I. B. E. W., Local No. 3, covers this question fully. Article 22 reads as follows: 'The use of machinery, tools, appliances or methods shall not be restricted or interfered with.'

(4) "The designation of employees for overtime work is entirely within the discretion of the employer, as set forth in Article 23 of the Agreement.

(5) "Temporary Wiring—The installation, connecting, shifting or repairing of all wiring for temporary lighting, heat and power in new buildings in course of construction, old buildings undergoing alterations or subways under construction, shall be considered in the possession of the Union electrician.

(a) "If overtime work is being conducted by any trade or trades, and temporary light or power are provided for same, such wiring being of a temporary character and not part of the perman-

ent system, an electrician should remain on the operation to take care of such temporary equipment.

(b) "Trailers' or extension lights shall consist of a socket, attachment plug, and not to exceed forty feet of flexible wire, which shall be made up and repaired by electricians but may be placed in various sockets or receptacles by trades using them. This applies to either lighting or power appliances.

(c) "Where temporary wiring has been installed for power, motors and power appliances, it may be operated by trades using them.

(d) "Where temporary lights and power are connected at permanent outlets and the outlets are locally controlled, they may be operated by anyone at any time.

(e) "Temporary lights for bridges or signs, or Safety lights for use of watchmen, or others visiting the premises, may be operated by anyone.

(f) "In cases where an electrician is employed to supervise a temporary installation, he shall perform other work, if so instructed by his employer."

The point of union acceptance of non-union men was raised in the following letter to Mr. Comstock, from Mr. Ryan:

I am enclosing herewith reference blank signed by representatives of the organizations, parties to local Trade Agreement, referring to the Council on Industrial Relations five questions on which the Joint Board have failed to agree.

In addition to these subjects, the following rule or mode of procedure to be followed by the parties to the Agreement when members of the Board of Trade wish to change from Non-Union to Union employment—the procedure proposed by the employer is as follows:

To facilitate business of employers who wish to change to Union employment, such Non-Union men in their employ and who have been trained in their work, shall make application for membership in the Union and pending their qualifying for such membership, temporary working cards shall be issued and remain effective until regular Union cards are issued or until the Trade Board decides that these men are not qualified for such membership.

The representatives of Local Union No. 3, I. B. E. W., in our conference on the submission of our disputes to the Council, have taken the position that the rule above set forth is not referable to the Council. Our contention is that the third paragraph of our Trade Agreement recognizes and reaffirms the declaration of principles adopted at the 1919 convention of the National Association.

The seventh principle reads as follows: "Cooperation between employee and employer acquires constructive power as both employees and employers become more completely organized." and as the question in dispute is one of

more complete organization of the employer, we submit that the question is referable to the Council.

Under these conditions we request a decision from the Council as to whether or not the subject in dispute is one that is referable to the Council under Article 3, of our Trade Agreement and Article 7 of the principles of the Council on Industrial Relations.

The conditions which prompt the employers to propose this working rule is the fact that in the membership of the Electrical Board of Trade of New York, Inc., we have about three hundred and fifty contractor members, about one hundred forty of whom are Union employers, the balance of the membership conducting open shops. A number of these open shop employers are firms of good standing and capable of performing contracts in considerable amounts and with whom the Union employers are frequently in competition on work where no other mechanics are employed and consequently Union conditions do not control. As the Non-Union wages are 33 1/3 to 40 percent lower than the Union wages, it is obvious that except on new building construction where Union conditions prevail, that the Union employers are seriously handicapped in competition with their open shop competitors under which condition it is obviously advantageous to encourage the open shop members to change their employment to Union shop conditions—in other words, to organize the industry as completely as possible.

We are totally at a loss to understand the Union's objection to this process. Available statistics indicate that the membership of Local Union No. 3 is not in excess of 5,000, certainly not over 5,500, which in comparison to conditions existing in Chicago, where the population is less than two-thirds of that in New York, the membership of the Local Union, we believe, is in round numbers 10,000.

As this procedure seems to be one in the direction of more completely unionizing the electric construction business in New York City, we trust that the Council will decide that in the interests of cooperation between the employers and Union officials, that this question as above set forth is referable to the Council and can be considered, and a decision rendered on this question, as well as on the other points presented in the blank.

The question was held by the Union not to be referable but after hearing oral arguments from both sides the Council decided as follows:

"By virtue of authority which created the Council, the Council holds that it has the right to review any question in dispute under any agreement containing provisions for settling disputes, by reference ultimately to the Council. In other words, the Council has jurisdiction in the case referred to.

"The Council does not, therefore, go into the merits of the question at this time, but urges the parties to this dispute to make a serious effort to arrange a working basis to accomplish the end sought, apparently, by both sides."

Big Increase in Philadelphia Electric Club Membership

More than four hundred people sat down to the annual banquet of the Electric Club of Philadelphia held at the Bellevue-Stratford on January 7. Throughout the dinner, vaudeville entertainment was provided and afterwards there were some addresses and then dancing.

Edwin Halley, the retiring president, was presented with an engraved gold watch by M. E. Arnold, in the name of the board of directors. Mr. Halley's administration was a most successful one in view of the fact that the membership was increased from 118 to 380.

A. L. Hallstrom, the new president, acting as toastmaster, introduced the two speakers: E. E. Whitehorne, of *Electrical World*, who spoke on the electrical league movement, and Congressman Arthur Free of California, who talked on the place of electricity in the modern community.

The officers for 1925, in addition to Mr. Hallstrom, are D. C. Birdsell, vice president, J. G. Crosby, treasurer, and H. A. Parsons, Jr., secretary.

As a surprise feature the guests were presented with the first issue of "Currents," the official house organ of the club, edited by Arnold G. Wilkening.

Commerce Chamber Begins Distribution Study

The project for a national study of the problems of distribution was formally launched at the initial meeting of the National Distribution Conference, held at the Chamber of Commerce of the United States, Washington, D. C., January 14 and 15.

More than two hundred delegates, representing trade associations, manufacturing and merchandising activities, and a number of economists and government officials attended the meeting, the purpose of which was to outline the field of investigation to be covered and to set up the machinery for conducting the inquiry.

The two-days' session was given over entirely to the discussion of the method of approaching the problem and the organization of committees to carry on the work. The field was divided into six sections, each of which will be covered by a special composite committee.

Subjects included in the inquiry are collection of business figures as a means

toward accomplishing economies in distribution, trade relations between retailer, jobber and manufacturer, market analysis, advertising, expenses of doing business, methods of distribution and general conditions affecting distribution.

It is assumed several months will be required to prepare the reports of the special committees. When they are submitted another general meeting of the conference will be called to consider them and to prepare a final consolidated report.

Urge Uniformity in Stating Mark-Up

In the interest of clarity and to protect some retailers from possible loss on merchandise through misconception of the margin available, the national vigilance committee of the Associated Advertising Clubs has issued a bulletin suggesting that all firms, in stating the mark-up available to the retailer, either figure the mark-up on the basis of the selling price of the merchandise, or clearly state that the mark-up advertised is figured upon the price paid by the retailer.

The Committee, with forty-two Better Business Bureaus in as many important cities and vigilance committees in many of the 320 local advertising clubs, is working for the elimination of deception from advertising.

"Some time ago," says the bulletin, "the National Vigilance Committee called attention to the loose use of the terms 'margin' and 'profit' by some advertisers, and the confusion which had resulted therefrom. Of late, the distinction between those two terms has been more generally maintained, but entire clarity has not been achieved.



An Electragist Should Use His Professional Name at Every Opportunity, for the Public is Beginning to Realize It Means Quality, Service and Responsibility. Here is a Photo Showing How the Tollner Electric Co., One of Brooklyn's Best-Known Electragists, Shows the Name to Advantage on One of Their New Trucks

Interesting New York Merchandising Figures

Gross sales of electrical appliances by 118 New York dealers during the year ending May 31, 1924, amounted to \$13,949,111, according to the results of a questionnaire distributed by the New York Edison Company. This figure was exclusive of the wiring and portable fixture sales of these dealers and gave an average per dealer of \$118,212.

The company received a total of 363 replies. Other data secured were as follows:

Seventy-five reported gross sales of lamp fixtures, either portable or for permanent connection, of \$2,438,797.

Seventy-eight reported electric wiring installed, exclusive of fixtures and devices, aggregating \$4,088,669.

Ninety-seven reported the approximate average value of electrical appliance and current consuming devices (other than lighting fixtures), carried in stock, of \$1,317,072.

Sixty reported an approximate average value of lighting fixtures, portable and permanently connected, carried in stock, of \$785,178.

The questionnaire was sent out by the company for the purpose of determining the extent to which merchandising of electrical appliances is being developed in the New York territory and to find out what the company could do to make this a more profitable field for manufacturers, dealers and contractors.

Philadelphia Inspection Charges Up

The ten percent reduction on charges for electrical inspection which was put into effect November 1, 1922, by the Philadelphia Fire Underwriters' Association, has been rescinded and, effective January 15, the charges were put back on the level maintained prior to 1922. The reduction, however, holds on all electrical contracts, signed previous to January 15, provided that the installations which these contracts covered were reported to the underwriters prior to that date.

Denver League Moves

Continued expansion of the activities of the Denver Electrical Cooperative League has necessitated the enlargement of the organization headquarters. The headquarters staff now occupies two large offices in the Gas & Electric Build-

ing. The rooms have been redecorated and partially refurnished and the league now enjoys the distinction of having the finest quarters of any organization in the city.

A dance and card party is scheduled for the membership on February 3, at the Progress Club.

Rocky Mountain League Officers

Officers of the Rocky Mountain Electrical Cooperative League for the coming years were elected at the recent meeting of the board of trustees. G. B. Hawley, vice-president and general manager of the Inter-Mountain Electric Company, was elected president. He previously served as vice-president and has been a member of the board of trustees since the organization of the league.

George R. Randall, who is one of the foremost contractor-dealers in the league, was elected vice-president, and R. M. Bleak was continued in office as secretary-treasurer.

The offices of the league, including its lighting service bureau, have been moved to 215-16 Kearns building.

Next Iowa Meeting in April

At the last meeting of the executive committee of the Iowa Association of Electragists, it was decided to hold the next meeting of the association in April instead of in February as had been previously planned. The gathering will be at Marshalltown, Iowa, and will take place on April 27.

Trumbull Head Now Connecticut Governor

John T. Trumbull, widely known in the electrical industry as the president of the Trumbull Electric Manufacturing Company, Plainville, Conn., was sworn in as Governor of Connecticut on January 8. He had previously been elected Lieutenant Governor on the ticket with Hiram Bingham, who won the governorship in the November 4 election and later was elected U. S. Senator.

Postcards That Make Them Attend

Are You One of Them?

A recent survey proved that the percentage of successful Electrical Dealers was small compared with merchants in other lines.

Fellows — We can no longer go it alone. We must organize 100% or we are lost.

Don't say, "I'll wait until they organize, and they'll come in." Ride on the Band Wagon. Don't Help Foot the Calico. Be at Milwaukee in January.

Annual Convention of C. & D. Association
Milwaukee, Jan. 28, 29, 30, 1925

Madison Committee

Are We Passing Out?

WHERE will the Electrical Dealer be a year from today? Will you be working for a Druggist or a Hardware dealer? If we don't organize we will. Your attendance at our January meeting is of vital importance. We have the proof.

Committee.

Annual Convention C. and D. Association
Milwaukee, Jan. 28, 29, 30, 1925.

IT'S UP TO YOU!

What will your business as a business be worth in a year from now? **CAN YOU ANSWER?** Your next State Convention will have the dope. Come—get in on it.

IT'S UP TO YOU!

Annual Convention C. and D. Association
Milwaukee, Jan. 28, 29, 30, 1925

Committee.

ARE YOU AWAKE?

Or are you just letting things slip along

Did the salesman with whom you placed your last order, sell the Hardware or the Drug Store twice as much as he did you?

Did He? You Don't Know! Why Not?

Come to the Convention.
We want to tell you something.

CUTHERE

Annual Convention C. and D. Association
Milwaukee, Jan. 28-29-30, 1925

Madison Committee

The attendance committee of the Wisconsin State Association of Electrical Contractors and Dealers has devised an unusual and effective means of inducing the members of the organization to attend the annual meeting in Milwaukee this month. Instead of getting out one letter, announcing the date of the convention, and then trusting to the individual member's sense of duty to his industry to bring him there, a series of postcards have been mailed to all mem-

bers at regular intervals. Four of these postcards are shown above.

From these samples, it can be seen how the committee impresses on the individual member the benefits that HE can gain from attending the meeting and helping to solve the problems that face the contractor-dealer field. No member can read these cards and feel that it is not to his vital and personal interest to be at the convention and devote serious thought to its problems.

Suggestions for 1925 Code Revision

In accordance with a vote of the November 1924 meeting of the Electrical Committee, the various Articles or Chapters of the 1923 edition of National Electrical Code become assignments of Article Committees of the Sectional Electrical Committee organization. A number of recommendations or suggestions have been received looking to additions or amendments to the Code. In addition to these listed below other suggestions will be acted upon at the February meeting of the Sectional Electrical Committee in the event that time available following their receipt permits their consideration by the appropriate Article Committee.

Article 2. General

206-b. Permit 3 holes for supporting screws in bases over 25 sq. in. in area.

206-c. Harmonize with 203-a as to carrying capacity when terminal lugs are required.

Article 4. Services

405-pp, b & c. When are externally operated switches not required at services.

405-b. Require that service wires be lead covered when in rigid conduit which traps moisture.

405. Designate type of switch for supplies exceeding 600 amperes.

405-f. Specify service switch and cutout equipment when transformers are within premises.

The Article Committee may submit revision of the entire text of Article 4.

Article 5. Wiring Methods

501 and 502. Consideration of Romex for open work and for concealed wiring.

501-i. Forbid fixture wires in contact with plaster under canopies. Also in concealed work.

502-c. Permit runners of 3-way switch circuits to be spaced less than 5 in. apart.

502-h. Make it clear that boxes or plates are required.

502-i. Require positive grounding or effective insulation of outlet equipment.

503-m. Revise Table for Conduit Sizes and Wiring including Service Conduits.

503-j. Define "different secondary voltages" in Clause 3 of note.

504-i. Define "insulation from ground."

503-h. Dissolve conflict with Section 905-1.

The Article Committee will continue the study of the problem of corrosion of conduit and other material in cinder fill. A report on this topic is not assured for the February 1925 meeting.

Article 6. Conductors

Polarity identification of flexible cords. Special cords for portable lamps.

Use of armored fixture wire.

Article 7. Outlet Boxes and Cabinets

702-e. Depth of cabinets to be increased to permit closing of doors when other than branch lighting circuit switches are open.

Article 8. Automatic Protection of Circuits

A technical sub-committee will report on the use of thermal cutouts and on points concerning number of trip coils as now required in 809-a.

The article committee may report on the use of circuit breakers generally, whether supplemented by fuses or not, especially with reference to Articles 805 and 807.

The article committee will also report on the following:

Requirements for fuses for systems over 600 volts.

Protection of services from transformers within premises.

Use of limited capacity cutout bases in branch circuits.

Limit branch circuit capacity to 1200 watts.

Limit number of lamp holders permitted on a branch circuit.

Permit 16 outlets on branch circuits.

Permit 1320 watts on branch circuits.

Supplying small motors.

Permit grouping of larger heaters on special branch circuits.

Require fusing of subdivided circuits over 30 amperes in ranges.

Article 9. Grounding

A technical sub-committee is giving special study to .4-wire 3-phase distribution system grounding.

The article committee will consider a suggested related series of changes and amendments throughout Article 9 proposed by the Groundulet Co., of Newark, N. J.

It will report on the following:

Permit one grounding conductor for up to three services under certain conditions.

Define what is insulation from ground, 905-1.

Article 10. Rotating Machinery and Its Control Apparatus

1003-c. Omit enclosures for squirrel cage motors.

1003-c. Omit specific reference to flour mills and grain elevators.

1003-f. Add current demand of rotors of slip ring motors to required name plate markings.

1003-g. A conflict in this text will be dissolved.

1003-h and i. Questions raised as to disconnecting switches will be considered.

Regulations covering the installation and use of motors operating at over 2500 volts to ground will be studied.

When can separable plug fittings be accepted for switches in portable motor installations?

Reduced hazards from motors having ball or roller bearings.

Location of low voltage automatic starters for high voltage motors.

Article 12. Switches

Marking of enclosed externally operated switches for disconnecting use.

Suggestions for dimension and test requirements for switches for voltages over 600.

Joint consideration with Committee on Article 14 of sockets as switches.

Article 13. Switchboards and Panelboards

A technical sub-committee will report on design and construction of switchboards.

1302-f. Change 660 watts to 15 amperes.

1303-c. Require that blades of branch switches be dead when open.

Require bus-bar capacity of 12 amperes for each branch circuit.

Article 14. Fixtures, Lamp Sockets and Receptacles, Plug Receptacles and Other Outlet Device

The Article Committee will consider a request from the National Council of Lighting Fixture Mfrs. for a specific description of one or more approved ways for securing polarity identification called for in 1402-b.

From another source is a request for a rule forbidding key sockets having the switch on the screw shell side only.

Another question is how to ground all parts

of lacquered chain fixtures. The old question of a 660 watt rating for all key sockets will be reviewed.

A recommendation that metal parts of fixtures be electrically connected to grounded neutrals of A. C. systems is to be considered.

Specific methods of installing fixtures and of securing fixture parts have been referred to the Article Committee together with several editorial changes or corrections.

Article 16. Heating Appliances

1602-d. Define "special circuit."

1602-d. Forbid switching of grounded wires.

1602-d. Permit "Out of Sight" location for switches.

1602-e. Forbid use of plugs in lieu of switches on stationary heaters.

1602-g. Require fusing of sub-divided circuits consuming over 30 amperes.

Article 19. Lightning Arresters

Shall lightning arresters or protectors be specified for small isolated electric lighting plants having outside wiring.

Article 33. Garages.

34. Motion Picture Studios.

35. Motion Picture Projectors, and

36. Organs.

Article 37. Radio Equipment

3702-j. Make the note part of the rule.

Specify separation of antennae and counterpoise wires from other wires about the premises.

Require weatherproof insulation on all antennae and counterpoise wires.

Article 60. Signal Systems

Require a specified performance of protectors.

Dissolve confusion as to application of Section 301.

Dissolve confusion as to application of Article 13 to Signal System Equipments.

Northern Californians Meeting at Sacramento

The first quarterly meeting of the California Electragists to be held in 1925 is scheduled for February 14 at Sacramento. The Hotel Travelers will be convention headquarters. Special arrangements have been made for those members in the San Francisco Bay district to go down to the convention city via boat. An executive committee meeting will occupy the morning session and at 1 o'clock there will be a general business meeting to discuss current problems in the contractor-dealer field. The meeting also will decide the time and the place to hold the sixteenth annual convention of the body.

New Toronto Officers

The Contractor-Dealers' Association of Toronto, Can., has elected officers for the coming year as follows: President, P. A. Cheevers; vice president, Gordon Moss; executive committeemen, B. L. Clark, E. A. Drury, George E. Davenport, Alfred Hicks and George A. Newman.

Gaschek Heads New Orleans Electragists

At a meeting of the New Orleans branch of the Association of Electragists, Frank Gaschek, head of the Crescent Electric Company, was chosen as president. This body is a new organization formed to take the place of the New Orleans Electrical Contractors' Association, which has been out of existence for some months, and his fellow contractors have entrusted to Mr. Gaschek the task of building up a strong local association.

S. J. Stewart has been elected vice president and I. G. Marks will serve as secretary-treasurer.

U.S. Commerce Chamber Publishes Fire Prevention Bulletin

Bulletin No. 15, on fire prevention in heating and power plants has been published by the Chamber of Commerce of the United States for distribution to architects, engineers and industrialists. The material in the bulletin was sponsored by the American Society of Mechanical Engineers.

It treats prevention of fires through proper design of plants and through proper maintenance.

Four Miles of Wire for Record Job

Details on some of the electrical quantities for the new Palmer House in Chicago, contract for which was placed late in the summer, are now available. This job was let for well in excess of \$600,000 and so far as is known is the largest single contract job ever let for electrical work. Other jobs have exceeded this, but not on original contracts.

The building will have twenty-three stories and two basements. Six floors will be devoted to shops and the remainder to the 2300-room hotel.

To wire this building 2,257,900 feet or more than four miles of wire and 1,160,130 feet of conduit will be used. Numerous convenience outlets have been provided, bringing the total number of outlets up to 37,320. One hundred and forty-two motors with an aggregate horsepower of 2,429½ will be used. The total connected load is to be 4,000 KW and the size of the main circuit breaker is 20,000 amps.

The work is now being installed by L. K. Comstock & Co.

News Notes Concerning Electrical Contractor-Dealers

Business Changes, Store Improvements and New Establishments Opened

Russell Kerstetter has disposed of the Home Electric Company, Wooster, O., to Shamp Brothers.

An interest in the Central Wisconsin Electric Company, Wisconsin Rapids, Wis., has been purchased by C. V. Wells, who was formerly in the electrical contracting business in Ladysmith, Wis.

A new electrical store has been opened at 159 North Church Street, Spartansburg, S. C., by Huntington and Gerry, Inc.

Claude Boyer and Stanley McIntyre have opened an electrical shop at St. Mary's, Pa., under the name of the Modern Electric Co.

Joseph H. Schmidt, who has been one of the leading electrical contractors of Wilkes-Barre, Pa., for the last ten years has established a merchandising department and will conduct his showroom at 176 Park Avenue, that city.

New and larger quarters have been taken by John Parrish, electrical contractor-dealer of Spencer, W. Va.

Kolb Brothers, electrical contractor-dealers of Pennsburg, Pa., have purchased the business of C. V. Rottenberger and will consolidate it with their own.

A new electrical firm, to be known as the Indiana Electric Company, has been established in Decatur, Ind. The owners are Bernard Clark and Gerald Cole.

Lewis V. Russell has purchased the electrical business of R. K. Jarrell, Frankfort, Ind.

An electrical contractor-dealer business has been established in Miami, Arizona, by D. C. Cook.

Frank S. Bush, who has been doing electrical contracting work in Elmira, N. Y., for the past year, has opened an electrical appliance store there at 311 West Water Street.

Cannon and Fields have announced the opening of an electric shop at 409 Main Street, Vincennes, Ind.

The H. E. Goodling Sales Company's new shop at 344 Market Street, York, Pa., is now ready for business.

Ortman Brothers, electrical contractors of Chatsworth, Ill., have bought the People's Electric Shop in Hoopeston, Ill., from B. A. Goudy and George Goudy.

Nobe D. Powell has moved his electrical business from 3235 East Anaheim Street to 1200 Gaviota Avenue, Long Beach, Cal.

Glendale, Ariz., has a new electric shop conducted by John Dyer.

A branch electrical store has been established at Philmont, N. Y., by the Hudson (N. Y.) Electric Company.

C. F. Ryan has opened an electrical shop at Littleton, Col.

The electrical business of Orville Huffman, Columbia City, Ind., has been purchased by Sam F. Garber.

A partnership, composed of H. A. Boulet, Lee Richardson and Harry Mullock, has opened an electric fixture establishment at 628 Main Street, Chico, Cal.

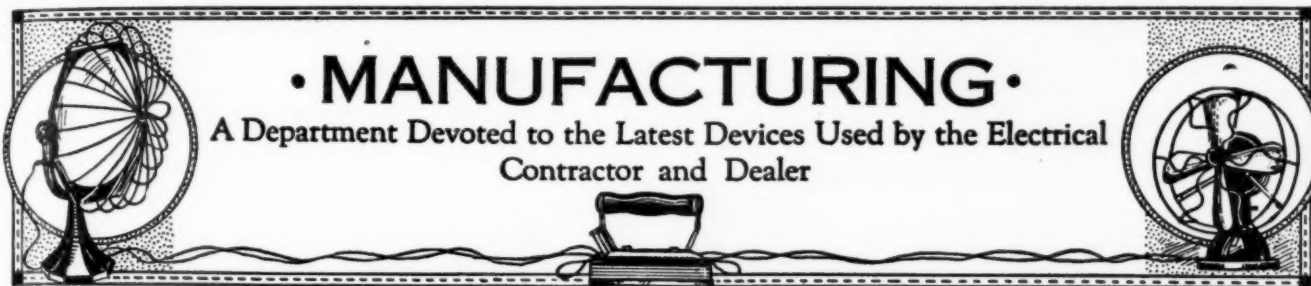
The Electric Supply Company has opened a retail store at Indiana, Pa.

Wagner Fan Executives

The Wagner Electric Corporation, St. Louis, has organized its fan sales department. The Wagner Corporation as announced, recently embarked upon the manufacture of a new line of fans for domestic and general service.

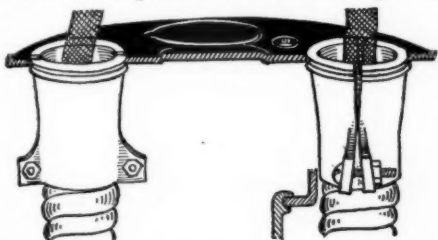
The manager of the new department is L. L. Goding, who has had considerable electrical merchandising experience, having been connected with the Century Electric Company, Jenny Electric Motor Division of the Arvac Manufacturing Company, Fairbanks Morse & Company and Peerless Electric Company.

I. Elkas, well known in the electrical jobbing and dealer trade, has been appointed special representative of the fan sales department.



Peerless "BX" Connector

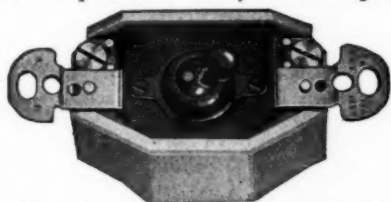
The "Velvet Edge" expansion flexible armored conductor connector made by the Peerless Electro Products Company, Baltimore, is to make unnecessary any other kind of bushing. When the connector is in place the "Velvet Edge" is



flush with inside of box as shown in illustration; the connector is entirely outside of box, leaving inside free and clear for splices, etc. The connector requires no locknut, is installed from outside of box and makes a perfect ground. It grips edges of knockout hole and cannot slip in or pull out after bolts which clamp outer end of connector to conductor are tightened. It may be used on any standard outlet or switch box, or panel-board.

Flush Toggle Switches

The new flush toggle switches recently brought out by Harvey Hubbell, Inc., Bridgeport, Conn., represent ten years of development work by that company.

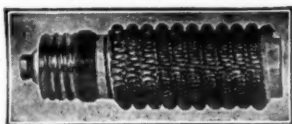


These new switches are equipped with a drum spring which is wound up by the action of the toggle handle. When the spring has reached its full strength it is released by what it known as a "lock and release" movement. This movement takes advantage of the full strength of the spring; consequently, it will break a greater load, in a smaller space, than any other form of toggle switch action.

The switches are made in white porcelain with toggle handles of black "Bakelite," and in black composition with toggle handles of brass. The brass handle type can be supplied with luminous tips. Both types can be supplied in single pole, double pole, three-way and four-way.

Heater Unit

The Waage Electric Company, 5100 West Ravenswood Avenue, Chicago, is now making an interchangeable reflector heater element under the name "Re-



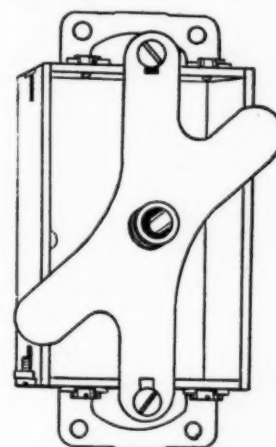
placeall" which fits most makes of reflector type heaters with standard sockets. All that is necessary to replace the burned out element is to unscrew the old element and screw in the new. Brass screws and nuts are used on the connections and the core is made of elemite; nichrome resistance wire is used; wattage is 660. The units are packed in individual boxes and there are twelve boxes in counter display case.

Set Screw Connector

A new set screw connector for flexible armored conductor made under the 1924 specifications is being manufactured by S. R. Fralick & Company, 17 South Clinton Street, Chicago. These specifications permit a reduction of thickness in the steel armor used on this cable from about 34 to 25 thousandths of an inch and the overall diameter of the cable is accordingly smaller. This has prevented the use of some of the connectors previously designed for the old cable. This new connector is designed to fit the new cable and has the tangential set screw for fastening that has been previously employed on connectors of this type.

Wiring Device

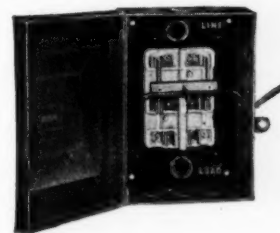
An interchangeable cross bar for use on installations of sidewall brackets has been patented by the Lanco Manufacturing Company, Newark, N. J.



A saving in labor and material cost is claimed for the box. It fits 3-in. round and pancake boxes and at the same time acts as a solid support for the fixture. Plenty of room is allowed for the splicing of wire without any interference with the space of the box.

Entrance Switch

The Federal Steel Products Company, Newark, N. J., has placed on the market a 30-amp, 250-v. externally operated entrance switch on porcelain base in 2 and



3 poles. This does not supersede the slate base switches made by the company, but is an addition to its line. The box contains combination knockouts in all sides and back, has "line" and "load" stamped in back of box, and is provided with attachments for sealing both the cover and the switch.

Window Reflector

The Holophane window lighting reflector, No. 944, (illustrated) is the latest development in the line of the Holophane Glass Company, Inc., New York, and has several features which are unique. The No. 944 is entirely enclosed so that the lamp filament cannot be seen from any position. This is of value when used in open back windows, such as are commonly found in automobile show rooms and furniture stores.



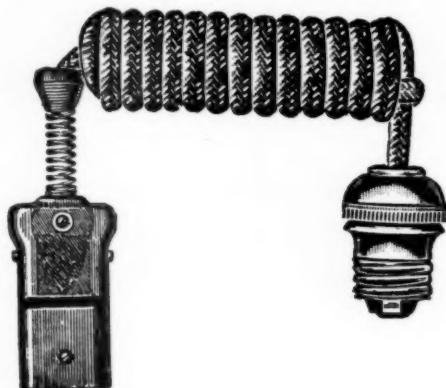
The Holophane Company is also making a new watchman's circuit unit, No. 830. It is constructed on the two-piece refractor principle, being smooth on both exposed surfaces. The hood is made of spun copper with medium base porcelain socket arranged for 1/2-in. pipe suspension. The light distribution is such that when the units are spaced on centers six times the mounting height, uniform illumination will be obtained.

Approved Mail Box

A mail receptacle for use in apartment houses is being manufactured by the Auth Electrical Specialty Company, 422 East 53rd Street, New York, under the approval of the U. S. Postoffice Department. The box meets all the requirements specified by the Postoffice Order which became effective September, 1924. It is made in groups up to twenty boxes with one master door; in rows of one-two-three and four high. With two master doors it can be made five rows high. The trim and door are so constructed that no iron parts, hinges, screws or rivets are exposed. The receptacles and tenants' doors are made extra wide so that mail can be placed in the box and removed without defacing it.

Heater Cord

The Reben Electric Manufacturing Company, 32 Union Square, New York, has brought out a new heater cord set which consists of an assembly of stand-



ard parts. The heater plug is a "Beaver" unit, the attachment plug a "Freeman" and the cord a "Rockbestos" product. These sets are supplied in dozen lots; each cord set being packed in an individual carton.

Reflectors

The Reflector Illuminating Company, 565 Washington Boulevard, Chicago, has just placed upon the market a new line of reflectors for show windows, display cases and interior lighting, to be known as "Sterling Stipple Reflectors." These new reflectors have a stippled finish which dispenses with fluting or corrugation, and a patented reflector holder which is adjustable and fits all



standard brass or porcelain sockets. The stipple finish is designed to break up shadows, circular ghosts and other objectional filament characteristics. The action of the stipple, which represents hundreds of tiny condensers, bends and redirects the reflection to the most useful directions without submitting to excessive absorption. These tiny condensers are so closely related that the reflected light emanating from each crystal light condenser is intercepted by the other with the result that shadows and circular ghosts are eliminated.

Condensed Notes of Interest to the Trade

C. R. Wood, of Moline, Ill., has been appointed district sales manager for the Waage Electric Company, Chicago, in the Iowa-Missouri-Nebraska district. He was formerly branch manager for the Westinghouse Lamp Company and vice-president and treasurer of the Tri-City Electric Supply Company, Davenport, Ia.

A new 96-page catalogue has been published by the Chicago Fuse Manufacturing Company, Chicago, showing the wiring and other devices made by the company. It also gives sizes, prices and other information on these products.

The Flexible Steel Lacing Company, Chicago, has revised its line of lamp guards to thirty-four numbers and has also announced a reduction of prices on the entire line.

The Pittsburgh Reflector Company has opened a branch in Chicago, which is located in Machinery Hall, at Clinton and West Washington Streets. James J. Kirk, for the past twelve years illuminating engineer with the Commonwealth Edison Company, has been appointed manager.

The E. H. Freeman Electric Company and the Trenton Porcelain Company have consolidated and hereafter will be known as the Circle F Manufacturing Company. The consolidation is not accompanied by any change in management, organization or business policy. Each company has been in existence over twenty years and in that time has distinguished itself in the wiring device and porcelain specialty field.

The Okonite Company will open an office at 310 South Michigan Avenue, Chicago, on February 1st and will take over the sale of Okonite products in the western territory. Charles E. Brown, formerly vice president of the Central Electric Company, has been appointed vice president in charge of the territory west of Pittsburgh and east of the Rocky Mountains of the Okonite Company, with headquarters in Chicago.

The Okonite-Callender Cable Company, Inc., has purchased a plant in Paterson, N. J.